

# THE JOURNAL OF SOCIAL PSYCHOLOGY

Political, Racial,  
and Differential Psychology

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JOHN DUNN

CARL J. HANSEN

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## NEUROTICISM IN MARRIAGE:

- I. THE PROBLEM AND ITS SIGNIFICANCE
- II. THE INCIDENCE OF NEUROTICISM\*<sup>1</sup>

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RAYMOND ROYCE WILLOUGHBY

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### OUTLINE OF COMPLETE STUDY

- I. THE PROBLEM (STATEMENT, HISTORY, SIGNIFICANCE, METHOD, SUBJECTS)
- II. THE INCIDENCE OF NEUROTICISM
  - A. The Scale as a Whole (frequencies, married subjects *vs.* students, variability, skewness, age, duration of marriage, size of family, occupation, region, source of contacts)
  - B. The Categories (fantasy, social, physical, parental, extrovert, sex)
  - C. The Items (including directory of items)
- III. THE APPRECIATION OF NEUROTICISM
  - A. Measures of Appreciation
    1. The Scale as a Whole
    2. The Categories
    3. The Items
  - B. Insight
    1. The Scale as a Whole
    2. The Categories
    3. The Items
  - C. Projection
    1. The Scale as a Whole
    2. The Categories
    3. The Items
  - D. Agreement
    1. The Scale as a Whole
    2. The Categories
    3. The Items
  - E. Difference and Error in Its Estimation
    1. The Scale as a Whole
    2. The Categories
    3. The Items

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<sup>1</sup>ACKNOWLEDGMENTS: The study here described was principally supported by a grant-in-aid from the Social Science Research Council. A portion of the incidental expenses was also defrayed by the Department of Psychology of Clark University. The careful and devoted work of Ruth B. Hudgins and Beulah S. Neet has been a major factor in the completion of the work.

- IV. HOMOGAMY
  - A. The Scale as a Whole
  - B. The Categories
  - C. The Items
- V. SUMMARY AND INTERPRETATION
- VI. REFERENCES
- VII. THE DATA

### I. THE PROBLEM AND ITS SIGNIFICANCE

The problem of the present study is that of ascertaining the incidence and something about the association and appreciation of certain so-called neurotic traits in marriage.

This problem has no particular history, so far as the author knows; it evolved in his own thinking quite naturally as a synthesis of interests in problems of personality and adjustment on the one hand and assortive mating on the other.

It has, however, a very substantial significance. Marriage is not only the most searching test of the individual's stability and adequacy of adjustment, but it is also the breeding ground for the adjustments of the future; control of maladjustments in marriage would probably eliminate most of the endogenous part of human misery within a century. The present study, of course, aims at nothing so far-reaching as control; it does not, in fact, touch the important problem of adjustment to marriage as such. It does attempt to survey the extent to which emotional or neurotic maladjustments of a more or less general sort are present in married couples, and the degree to which there is mutual understanding in respect to these maladjustments. A logical second step would be an investigation of the extent to which married persons are adjusted to marriage and conscious of each other's relative adjustment thereto; and a third would be the extent to which maladjustment of the general kind considered here is causally related to marriage maladjustment. Further important corollary studies would deal with the distribution of general emotional adjustment in groups characterized by extremely good and extremely bad marital adjustment, and the same distribution as related to the emotional adjustment of the children concerned.

The methodology is that of the standardized questionnaire, the instrument used being the Thurstone Personality Schedule. This was altered (*a*) by striking out paragraphs 1 and 3 of the printed directions on page 1 (paragraphs framed from the viewpoint of the

college mental-hygiene officer); and (b) by the addition (typed) of the following paragraph in the space at the top of page 1:

After you have circled the answers that indicate your own reaction, please check every item for which you think your spouse's answer (on himself) would probably differ from your own (on yourself);\* do not compare notes. Give your fundamental, emotional, naive reaction; do not strive for logical or historical exactness, and do not spend much time on any one question.

To the direction "In front of each question you will find: yes no?" the following was added:

Do not use the ? If you do not know the answer, guess.

The original directions which were not altered are as follows:

This is not an examination. It is not a test in any sense, because there are no right and wrong answers to any of the questions in this blank. . . . Draw a ring around one of these answers for each question. Try to answer by "yes" or "no" if it is possible.

As it became clear that a substantial proportion of subjects tended to omit the checking operation, the words *please . . . notes* in the auxiliary directions were underlined in red pencil. The second blank of each pair was inscribed

In order to save clerical labor on the part of the investigator, please consult the other blank for accessory instructions and alterations.

As the investigation progressed, this second blank was marked, under the inscription just noted,

Please do not forget to check the items on which Mrs. - - 's answers would probably differ from yours.

and these words were emphasized by underlining and arrows in red pencil. In addition, spaces were provided at the top of the first blank for information on age, duration of marriage, number of children, and occupation. Blanks on which this information was not given were not returned to the subjects, but those on which the

---

\*The suggestion that each spouse estimate the other's answers is due to Mrs. M. D. Lerner, an early subject; the specific device used, which was unsatisfactory, is due to the author.



checking operation was incomplete were sent back (if the subject could be identified) with a request to furnish the additional information.

It is clear (at the date of writing) that the procedure as outlined contains a number of sources of error. The data to be presented later on the underestimation of the amount of difference between the spouses indicate what perhaps should have been evident earlier, namely, that the checking device, although perhaps the only one feasible under the conditions, was seriously inadequate in that it fails to differentiate between the person who believes no difference to exist (in a given item) between himself and his spouse, and the one who is not so sure, but forbears to mark it because of the additional labor involved. It is also inadequate in that it is frequently misunderstood—often by highly intelligent people—and frequently omitted.

Circularization by mail was employed. It is unsatisfactory in that the attitudes of the recipients are very varied, in that an unknown amount of collusion exists, and in that the subjects are prone to argue with themselves, their associates, or the investigator (when available) about the real nature of their attitudes until they have successfully obliterated these in favor of substitutes more in accord with the "official personality." Finally, the schedule itself, although among the best of available personality instruments, has the grave limitations inseparable from the questionnaire method of investigating personality; the most important of these is susceptibility to complete vitiation by compensatory mechanisms, and only less serious is the impossibility of obtaining any information upon, much less controlling, the major variable of rapport or "transference." In addition, the scale is too long to be inviting to any but a psychological enthusiast; occasional subjects detect and resent the occurrence of duplicate items; several items are "dead wood," being answered in one way by nearly all subjects (as will be evident in some of the later analyses); two subjects pointed out the inadequacy of the items to bring out differences of which they were conscious; and many items are incapable of a definite answer (subjects were instructed, after the first few returns, to use only the Yes or the No, guessing where they were not sure; the few ? responses of the first subjects were converted to the definite response they seemed to indicate); the latter include items perceived as "double-barrelled," ("Do you think most people are self-seeking or malicious?"), items covering a period of time ("Were you happy when you were four-



teen to eighteen years old?"), certain apparently factual items permitting ambiguous interpretation ("Have any of your family committed suicide?"), and vaguely quantitative items ("Are there many people you want to get even with?").

To supplement the above paragraph, an indication may be given as to what would now be considered better procedure for the investigation: The subjects should be brought together at one place and time, assigned identifying numbers to be known only to themselves (numbers such as will indicate which papers belong to spouses), and have the questions *read* to them from some shorter instrument than the Thurstone inventory (say the Bernreuter, or better, a list of statistically tested questions known to be diagnostic); the responses should be written upon a paper upon which are printed numbered blanks, each response being in terms of Yes or No, and each being assigned only as much time as is necessary to indicate it. It may be asked whether, in the absence of such ideal conditions and in the presence of the sources of error noted above, the present study is worth while; the answer to this must be in terms of results—if significant differences between groups appear in spite of the errors unfortunately present, then the true differences which might be found under better conditions may be supposed to be still greater. Somewhat prematurely, it may be said that they do so appear.

The schedules, with instructions as indicated and a brief explanatory note,<sup>2</sup> were distributed by mail, as indicated above; in all cases return postage was provided. The principal groups approached were the Worcester College Club (a women's alumnae organization), the faculty of Clark University, the staff of the Worcester State Hospital, and the investigator's present and former associates.

It is clear that the group used is one selected from the superior end of the economic, social, and educational scale; the study is thus one of the incidence and appreciation of neuroticism in very intelligent groups, and only tentative inferences may be made for other groups.

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<sup>2</sup>"An exploratory study is being made of the degree of similarity in emotional reactions between husband and wife. If you and your spouse would be willing to cooperate, I should be very grateful if you would fill out and return the accompanying blanks, and if you would note upon them the names and addresses of other couples who would not object to being approached for this purpose. If you are not interested, please return the blanks."

The following analysis is designed to quantify somewhat the above general observations:

Approximate number of pairs of blanks sent out	560
Number of blanks returned satisfactorily executed	139
Approximate number of pairs of blanks returned incomplete and sent back for completion	28
Approximate number of pairs sent to Worcester College Club	140
Returned identifiably	38
Approximate number of pairs sent to faculty of Clark University	26
Returned identifiably	10
Approximate number of pairs sent to Worcester State Hospital staff	6
Returned identifiably	3
Approximate number of pairs sent to writer's associates	175
Returned identifiably	51
Approximate number of pairs sent to recommended persons	213
Returned identifiably	57

Occupational distribution of husbands returning usable pairs:

Group A: teachers 48, physicians 7, ministers 5, psychologists 3, students 3, lawyer 1, librarian 1, metallurgical engineer 1, research engineer 1, civil engineer 1, statistician 1 (72 = 69%).

Group B: managers 3, manufacturers 3, merchants 2, advertiser 1, bank treasurer 1, ceramist 1, fruit grower 1, investment broker 1, machine designer 1, mortician 1, newspaperman 1, scout executive 1, x-ray technician 1 (18 = 17%).

Group C: salesmen 6, clerk 1, collector 1, electrician 1, foreman 1, meterman 1, radio service man 1, sales engineer 1, traffic manager 1 (14 = 14%).

Occupational distribution of wives returning usable pairs:

Group A: teachers 7, students 4, psychologists 3, musicians 2, writers 2, physician 1, research worker 1 (20 = 24%).

Group B: housewives 57, policewoman 1, social worker 1 (59 = 72%).

Group C: clerk 1, saleswoman 1, secretary 1 (3 = 4%).

Occupational distribution (in terms of above groups) of persons recommending other couples (*H*=husband, *W*=wife):

H	W		H	W		H	W		H	W	
A	—*	7	B	—*	1	C	—*	2	—*	—*	11
	C	0		C	1		C	0		C	0
	B	10		B	4		B	1		B	3
	A	3		A	0		A	1		A	1

\* Occupation not given.

Occupational distribution of such of recommended couples as returned usable pairs:

H	W		H	W		H	W		H	W	
A	—	17	B	—	1	C	—	2	—	—	15
	C	0		C	1		C	0		C	1
	B	11		B	4		B	4		B	9
	A	4		A	0		A	1		A	1

347 first approaches yielded 142 recommendations, which yielded 52 recommendations, which yielded 10 recommendations.

## II. THE INCIDENCE OF NEUROTICISM

### A. *The Scale as a Whole*

Each item of the scale may be answered in either a relatively adjusted ("normal") or a relatively maladjusted ("neurotic") manner; the validation of this differentiation is fully described by Thurstone (3) and may be concisely described as correlation with total score; ultimately, like every other such criterion, the validation depends on concurrence with clinical impressions of adjustment. The unit of score is a single item answered in the maladjusted manner,

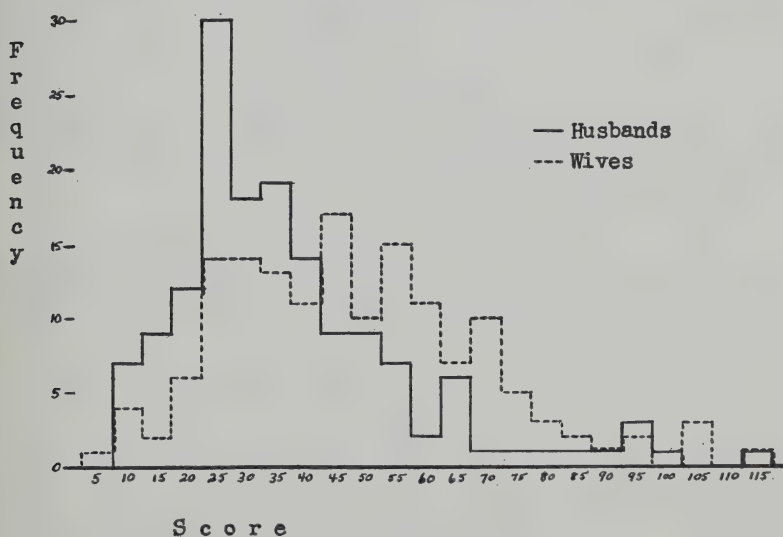


FIGURE 1

and the "total neurotic score" is the number of these units for a given subject; the latter is accordingly the most general description possible. The distribution of this measure for husbands and for wives is given in Figure 1; under each class index (which, as will be the convention throughout the study, is the lower limit of the class) are given in order the class frequencies for husbands and for wives.

These distributions may be compared with three published distributions for men and one for women [Thurstone (3), Harvey (2), Allport (1)] and with one for each sex derived by the author from data kindly supplied by Dr. Norman L. Munn of the University of Pittsburgh; the latter represent the complete data for the class entering the University in 1930 (after which the use of the scale was discontinued); they are presented here in full:

	0	5	10	15	20	25	30	35	40	45	50	55	60
Men	4	22	40	56	67	69	78	82	63	59	58	39	34
Women	1	13	9	18	18	14	20	16	18	19	13	10	17
	65	70	75	80	85	90	95	100	105	110	115	120	125
Men	25	30	14	7	14	9	2	2	1	0	0	0	0
Women	12	6	6	2	0	2	2	0	1	0	1	2	0
150 Total													
Men 0 775													
Women 1 221													

Figure 2 exhibits the relationships between these different distributions in the form of percentile curves.

Attention is called to the following facts:

1. The women are more neurotic than the men in all cases, and significantly so in all but one. The amount of difference between the sexes appears to be somewhat higher in the present material than in those of preceding workers:

	M		$d_M$	$\sigma d_M$	$d/\sigma d$	$\sigma$	
	M	W				M	W
Thurstone	37.3	43.8	6.5	1.71	3.8	22.4	22.3
Harvey	41.9	46.8	4.9	3.47	1.4	25.4	20.2
Allport	41.1					21.6	
Pittsburgh	40.3	42.2	1.9	1.79	1.1	20.4	24.2
Willoughby	42.2	51.5	9.3	3.30	2.8	21.2	22.7



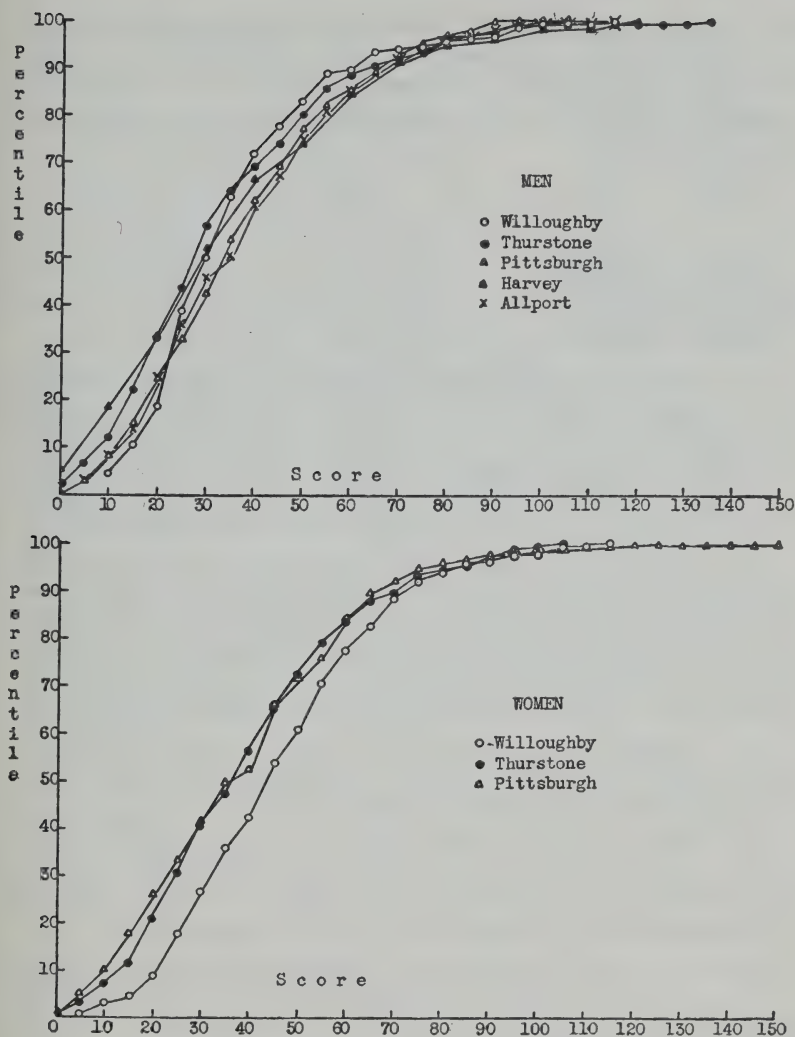


FIGURE 2

In about 75% of the couples the wife is more neurotic than the husband, as against about 25% in which the reverse is true; the difference of 50% has a standard error of 4%.

2. These married persons (of college level) are more neurotic than all the college series observed, and significantly more so than Thurstone's University of Chicago freshmen and the Pittsburgh women; the differences, with their standard errors and critical ratios, are as follows:

	<i>d</i>	M <i>σd</i>	<i>d/σd</i>	<i>d</i>	W <i>σd</i>	<i>d/σd</i>
Willoughby—Thurstone	4.9	2.2	2.2	7.7	2.3	3.3
Willoughby—Harvey	0.3	2.8	0.1	4.7	3.4	1.4
Willoughby—Allport	1.06	2.41	0.4			
Willoughby—Pittsburgh	1.9	1.95	1.0	9.3	2.53	3.7

3. There is no significant sex difference in variability as measured by the standard deviation; the coefficient of variation is perhaps significantly larger for the husbands, due to their lower mean, but the meaning of this is doubtful, and the significance in any event is not beyond question. The total ranges are very nearly the same.

4. Both distributions are markedly skewed, the mode being displaced toward the low end. This constitutes some reason for believing that personality traits are not distributed normally; extremes of maladjustment, it appears, are more pronounced than extremes of adjustment. Part of this is due to the fact that the expression of these extremes is limited on the low end by the zero of the scale, while at the higher end the scope afforded (223) is much greater than the largest score yet made (152); that it is not all due to this cause is indicated by the fact that actually zeros are rarely made, only one having been reported to date.

A number of other variables may be related to total neurotic score. One of these, age, has already been suggested by the differences between married persons and students of the same sex and educational level. The distribution of ages is as follows:

	20	24	28	32	36	40	44	48	52	56	60	64	68	Total
Husband	1	13	33	20	13	12	5	4	1	1	1	0	1	105
Wife	12	17	27	18	17	7	5	4						107

In the present series, the correlation between wife's age and her neurotic score is  $-.11 \pm .07$ , while that for the husband is  $.06 \pm .07$ . The regression line of score on age for the wives shows traces of

curvilinearity, a peak being evident at about 30 with slopes both ways.

	Husbands	Wives
Average age, most neurotic 40%*	35.8	29.2
Average age, least neurotic 40%*	33.6	32.8
Average score, oldest 40%*	43.4	48.7
Average score, youngest 40%*	36.5	49.5

\*Approximate.

The probable errors of differences between these values, while not strictly valid because of the anomalous forms of the sub-distributions, are of the order of 6 for the scores and 2 for the ages. The differences are accordingly not statistically significant; but they are consistent, and seem to indicate a very slight tendency for the younger women and the older men to be the more neurotic. Comparing these findings with the differences of the present series from comparable students, it appears that the cause of the latter is to be sought in the concomitants of marriage itself and not in mere increasing age.

The range of ages for the wives is from 21 to 50, for the husbands 21 to 68. The mean score for wives omitting to state their age is  $51.1 \pm 1.88$  ( $N=55$ ) and the corresponding figure for husbands  $36.7 \pm 1.85$  ( $N=56$ ). This is indistinguishable from the general mean for the wives, but approaches a significant lowering for the husbands.

Much interest also centers in the relation between neuroticism and duration of marriage. The distribution of duration (in years) is as follows:

0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	Total
12	27	26	17	9	8	8	10	1	3	4	3	2	0	1	131

The correlation for husbands is  $.01 \pm .06$ , for wives  $-.16 \pm .06$ . Analysis on the above lines yields the following:

	Husbands	Wives
Average duration, most neurotic 40%*	7.2	6.2
Average duration, least neurotic 40%*	8.6	8.1
Average score, 40% longest married*	39.0	46.7
Average score, 40% most recently married*	41.0	48.0

\*Approximate.

Two and six may be taken as approximations to the probable errors of these differences, with the familiar result that the latter are not statistically established. Again, however, they are consistent, and point to a slight decrease in neuroticism with increasing length of marriage, for both sexes. Allowance must, however, be made for the correlation between age and duration of marriage, which amounts to  $.90 \pm .01$  for the men and  $.91 \pm .01$  for the women. Letting 1 represent total neurotic score, 2 duration of marriage, and 3 age, we have the following partial correlations:

	Husbands	Wives
$r_{12.3}$	$-.10 \pm .07$	$-.14 \pm .07$
$r_{13.2}$	$.12 \pm .07$	$.09 \pm .06$

We may also separate out groups differing in age and duration of marriage. The average scores for these groups are:

<i>Husbands</i>			
	Older		Younger
Long duration	$40.4 \pm 1.9$	(N=37)	$39.9 \pm 2.8$ (N=12)
Short duration	$44.7 \pm 4.4$	(N=13)	$37.6 \pm 1.6$ (N=44)
<i>Wives</i>			
	Older		Younger
Long duration	$47.4 \pm 2.1$	(N=41)	$57.0 \pm 4.6$ (N=11)
Short duration	$54.3 \pm 2.7$	(N=11)	$47.4 \pm 2.3$ (N=46)

The differences between these values, in consequence of the small numbers, are not statistically significant, nor are they entirely consistent. If we take as a tentative generalization the testimony of the partial correlations, viz., that the tendency of both sexes is (1) to become more neurotic with increasing age and (2) less neurotic with increasing duration of marriage, we find the means supporting (1) in three comparisons out of four and (2) two out of four. In both cases the younger couples, especially the younger wives (in whom the age-score relation is most marked) are the discordant factor. Probably the safest conclusion is that, although sex differences of an especially interesting sort (involving antagonistic effects of age and duration, and reversed as between husband and wife) seem to be suggested, they cannot be demonstrated on the present population, and await special investigation.



It is conceivable that the advent of a child or a family of children may have an effect upon neuroticism. The distribution of children in the present population can be read from the list of uncorrected mean scores for the different sizes of family:

	Husbands M	Wives M	N
No children	41.3 $\pm$ 2.0	47.7 $\pm$ 2.5	43
One child	35.3 $\pm$ 1.6	54.6 $\pm$ 2.5	38
Two children	42.3 $\pm$ 2.5	47.5 $\pm$ 2.1	31
Three children	39.4 $\pm$ 7.3	38.9 $\pm$ 5.4	8
Four children	32.0 $\pm$ 1.8	52.0 $\pm$ 1.8	6
3-4-5 children	37.3 $\pm$ 4.0	43.7 $\pm$ 4.0	15

No value of *d/P.E.d* exceeds 2.4, so that again no differences can be demonstrated. The figures, however, again suggest interesting sex differences which might repay special study. It seems possible that the childless are likely to be more neurotic (or that the neurotic are more childless) than those with families of 2-5 children, and that the advent of the first child, especially, is likely to diminish the anxiety of husbands (the Freudian "castration anxiety" is suggested) and increase that of wives (whose personal activities are, normally, seriously hampered thereby). Roughly the same tendencies are evident when age and duration are kept approximately constant; the following are the corresponding figures for the fourth decade of age and less than a decade of marriage:

	Husbands		Wives	
	M	N	M	N
No children	46.7 $\pm$ 3.5	19	60.3 $\pm$ 4.5	9
One child	35.1 $\pm$ 2.6	13	61.2 $\pm$ 4.3	13
Two children	50.2 $\pm$ 5.2	8	52.5 $\pm$ 3.4	11
3-4-5 children	33.3 $\pm$ 4.4	4	38.2 $\pm$ 4.0	4

Small populations make it impossible to apply the same procedures on different levels.

The occupations of the subjects have been classified into three categories, of which A is the most abstract or most completely professional and C the least so. It is of course difficult and arbitrary to make any division of a group as homogeneous as this one; but the occupations thrown into each category may be read from page 8. In the following presentation of mean scores, the entries under

*Wives* refer to wives who were or are themselves of the occupational group specified, not wives of husbands of that group:

	Husbands	Wives	N
Occupations omitted	38.1±1.8	51.6±1.6	55, 77
A	40.0	48.0	72, 20
B	39.1	47.6	18, 59
C	45.6	34.0	14, 3
Male teachers	43.0		48

Taking the probable error of these differences as 2.5 and disregarding the value 34.0 (based on three cases), it is clear that these differences are unsystematic and probably due to chance. The material is homogeneous, although the sex difference appears consistently in any grouping made.

The material was collected from a number of geographical regions,<sup>3</sup> all within the United States. The following are the mean scores distributed in this way:

	Husbands	Wives	N
New England	39.7±1.7	48.0±1.5	68
Middle Atlantic	45.8±2.5	47.5±2.8	26
Central	38.4±3.0	47.8±3.6	18
Southwest	35.8±2.9	62.5±7.1	6
Pacific	50.2±4.8	57.6±5.3	8

The critical ratios for the largest intra-sex differences are only about 2, so that there appear to be no valid differences as between regions. The material, as before, is approximately homogeneous, but the roughly constant sex difference shows up as elsewhere.

<sup>3</sup>The grouping is as follows:

New England		Middle Atlantic		Central	
Connecticut	1	Delaware	1	Arkansas	1
Massachusetts	65	District of Columbia	1	Illinois	1
Rhode Island	1	Maryland	2	Kentucky	1
Vermont	1	New Jersey	1	Minnesota	5
		New York	10	Missouri	3
		Pennsylvania	10	Ohio	6
		Virginia	1	Wisconsin	1
Pacific		Southwest			
Washington	3	Texas		2	
California	5	Colorado		4	

Besides the population contacted directly (Worcester College Club, Clark faculty, author's acquaintances) we may distinguish a population contacted through the latter (first-order recommendations), and second- and third-order recommendations in parallel fashion.

We have the following mean scores for these:

	Husbands	Wives	N
First order	37.6 $\pm$ 2.7	44.4 $\pm$ 2.5	23
Second order	38.2 $\pm$ 1.5	52.2 $\pm$ 2.3	49
Third order	27.3 $\pm$ 1.8	47.7 $\pm$ 3.1	15

Although some of these differences are fairly large (the probable error of the largest male difference is 2.3 and of the largest female difference 3.4, making the critical ratios [ $d/P.E.d$ ] 4.9 and 2.3) they are not systematic, and appear to be random divergences in a reasonably homogeneous population.

### B. The Categories

The items of the scale have been divided arbitrarily, though more or less empirically, into six groups or categories; these arose from consideration of the content and similarity of the actual items, not from any preconceived idea of what types of items should make up a neurotic inventory. The only such classification available at the time was the partial one indicated by Thurstone in his original article, and the sex and parental-attitudes categories were taken from his; it was believed wisest to make the categories exhaustive and exclusive.

It appears at first sight that the items assigned to each category should be presented here, and that they are misplaced by being reserved for the section on the items; the differentiating criterion is that the present section is reserved for summary results for the categories *considered as sub-scales* (e.g., for a comparison of Fantasy scores with Social scores), while the following one is reserved for material on the scores on individual items, with only a minimum amount of material concerning the categories as units in themselves. Since space limitations forbid printing the items in full twice, it has been thought best to place them as near as possible to the evaluative data on them. The items defining the categories exactly will therefore be reserved for the next section; the descriptive names of the

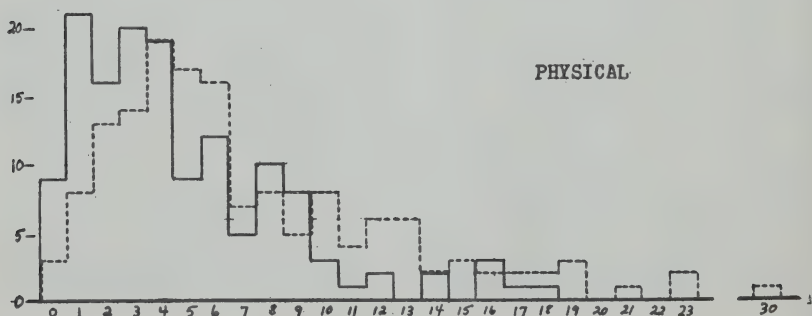
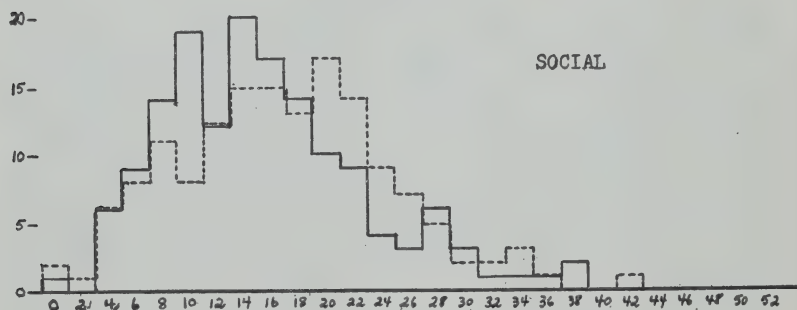
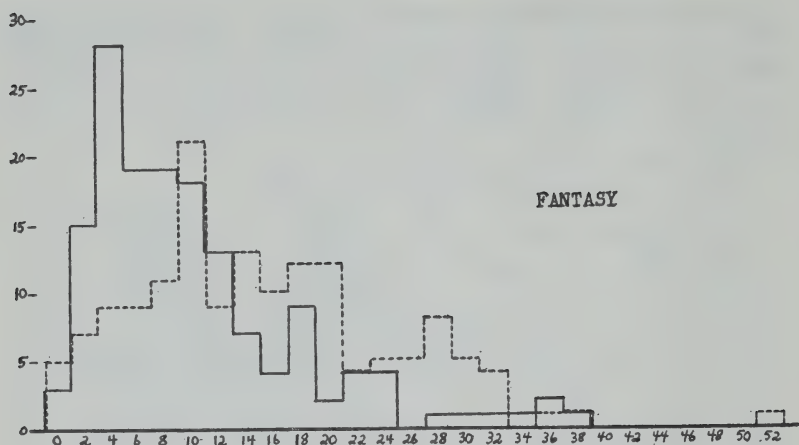


FIGURE 3

Abscissas, score; ordinates, frequency. Solid line, men; dotted line, women.

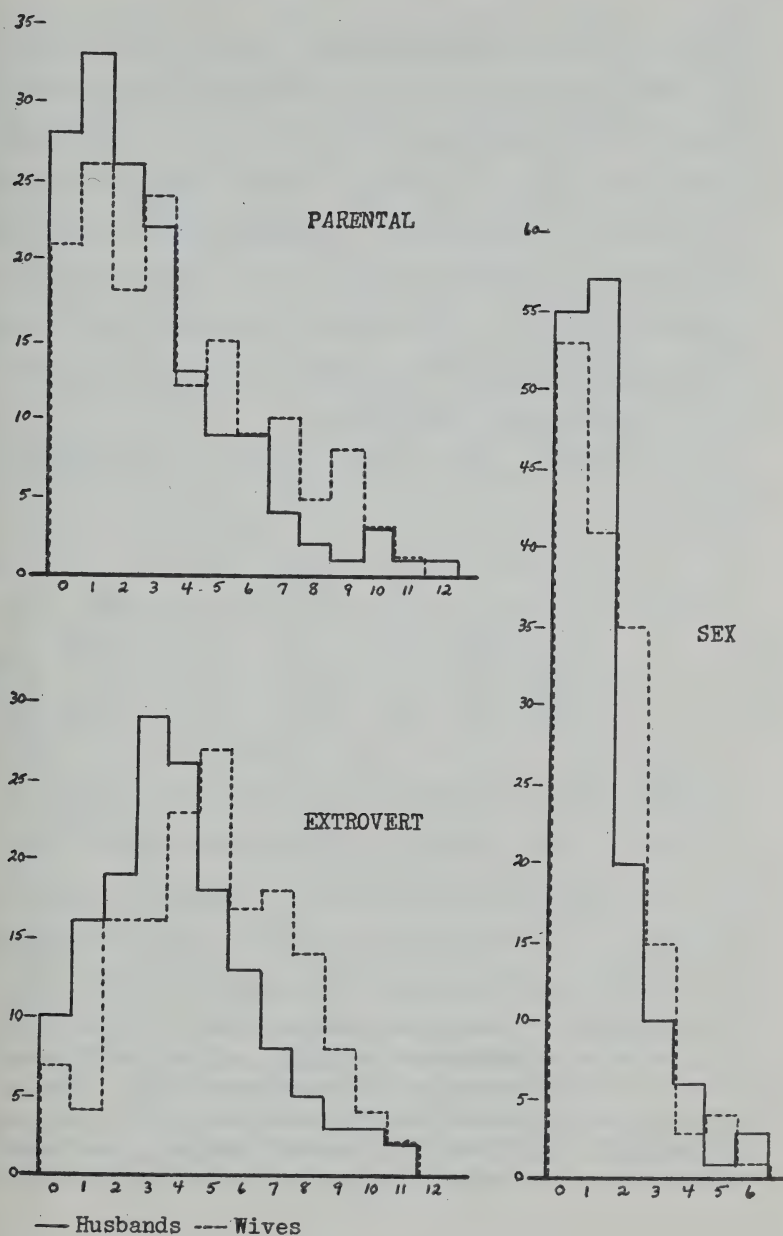


FIGURE 3  
(continued)



latter are: Fantasy (*Fa*), comprising items concerning the inner experience of the subject; Social (*So*), comprising items having to do with his reaction to companions; Physical (*Ph*), comprising items concerning the subject's somatic condition or functioning; Parental (*Pa*), comprising items having to do with his relations with his family, particularly his parents; Extrovert (*Ex*), comprising items relating to his behavior with respect to the non-human portion of his environment; and Sex (*Sx*), comprising items referring to sexual attitudes. The present section is devoted to a presentation of the neurotic scores for each of these categories regarded as a sub-scale; that is, to a study of the incidence of maladjustment in the social field, the fantasy field, etc., measured as before by the number of items in the given category marked in the maladjusted manner. The distribution graphs are presented first.

The following table shows the sex differences in the different categories, with the critical ratios indicating their relative reliability ( $N=152$ ):

	Mean		$d_M$	$\sigma d_M$	$d_M/\sigma d$	$\sigma$		$V$	
	H	W				H	W	H	W
Fa	10.50	15.40	4.9	.97	5.0	7.7	9.2	73.3	59.7
So	15.90	17.30	1.4	.87	2.0	7.4	7.8	47.5	45.1
Ph	4.79	7.19	2.4	.52	4.6	3.7	5.3	77.3	73.7
Pa	2.68	3.51	.8	.36	2.3	2.5	3.0	93.2	85.5
Ex	3.87	5.03	1.2	.89	1.3	2.4	2.5	62.0	49.7
Sx	1.14	1.29	.2	.14	1.0	1.2	1.3	105.0	100.9

It is worthy of attention that the now well-established difference between males and females as to adjustment on total scale is reflected in such categories as have been set up in the present division. However, it appears that the categories Extrovert, Parental, and Sex are least discriminative, and this difference, in view of other evidence (Willoughby, 4) is probably to be ascribed to the unrepresentative character of these categories rather than to an important sex difference in these types of neuroticism. The Fantasy category proves to discriminate most effectively and reliably, with the Physical category a close second. Somewhat surprisingly, the Social and Parental categories yield differences of only border-line reliability. The extremely large relative variabilities obtained for some of the categories should probably not be taken very seriously, since they are derived from measures of very small size, having distributions plentifully

sprinkled with zeros. A tendency is evident for the wives to be less variable with respect to their higher mean than are the husbands with respect to theirs, although the raw standard deviations show the opposite trend. Of the categories containing sufficient numbers of items to warrant comparison, the Fantasy and Physical appear to yield variabilities greatly in excess of the Social, indicating perhaps the superior efficiency of the social environment in reducing personality and its maladjustment to a relatively uniform type.

It will be desirable to learn whether there are differences between the categories, i.e., whether the Social sphere, e.g., is a more fertile source of maladjustments than is the Fantasy sphere. This problem is complicated by the fact that the numbers of items in the categories vary from 10 (Sex) to 72 (Fantasy); comparisons, therefore, cannot be made directly. They may be made, however, by the use of an adaptation of the percentile ogive curve. Thus in comparing an 18-item with a 72-item category, both may be placed upon the same abscissa by making the scale unit for the former four times as long as that for the latter; the ordinate in both cases is the same, viz., the proportion of the population reaching the corresponding abscissa value. The curves drawn in this way are presented in Figure 4.

Recalling that by the method of derivation leftward direction indicates relative freedom from maladjustment and the reverse, and that steepness of slope indicates relatively slight variability among the population and the reverse, we may make certain observations of some interest from these curves. In both men and women sex is the field (of those here set up) involving the least maladjustment, social relationships that involving the most; fantasy life is as troublesome as social relationships in the women, but takes a relatively unimportant position with the men, the second most difficult category with them being that concerned with the management of the non-human environment. Physical items give relatively little trouble to either sex, and variability in this respect is relatively small; variability is relatively large in items involving family relationships, in "extroversion," in social relationships, and (for the women only) in sex and fantasy items. Many of these differences are large and significant. Ninety per cent of the women are maladjusted on less than 25 to 48% of the items (depending on category), and the corresponding range for the men is 20 to 44%; this has a relationship to the large number of low-incidence items present in the scale,

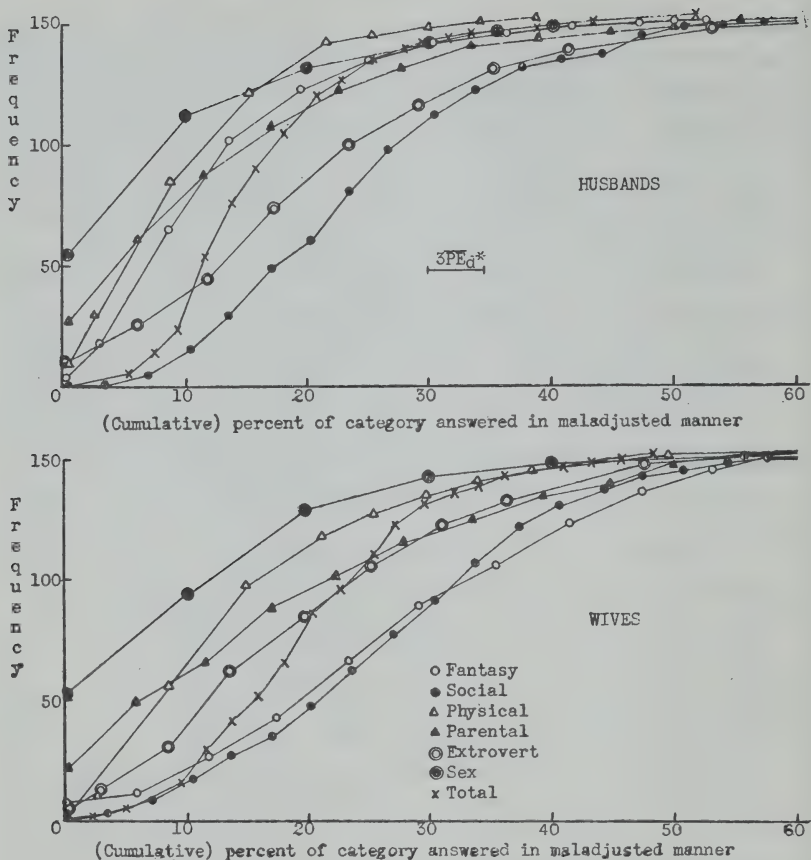


FIGURE 4

\* $PE_d$  = approximate average probable error of differences between curves at their first and third quartiles, i. e., at ordinates 38 and 114; this value is a little less than that shown between these points and a little more outside them. Horizontal differences between curves can therefore be regarded as significant if they exceed the distance shown for  $3PE_d$ .

to be discussed later. The above considerations may be stated from a rather different angle by saying that, so far as these data show, a scale for the detection of neuroticism should contain chiefly items of social, fantasy, and extrovert significance; correlations of these categories with the total scale have been found elsewhere (Willoughby, 4) to confirm (approximately) this finding.

An additional measure of the extent to which the different categories yield maladjustment may be derived from the average incidences, which may be seen from the following table to confirm, approximately, the preceding results:

	Husbands	Wives
Fa	14.20	21.01
So	26.65	29.59
Ph	10.23	15.50
Pa	15.21	19.62
Ex	22.06	28.80
Sx	11.20	12.90

### *C. The Items*

The incidence of the specific items may best be considered as grouped under the categories. Although at first sight this may seem to include material in the consideration of the items that should have been treated under the categories, it seems psychologically preferable to hold the items within reasonably small and homogeneous groups for discussion and comparison, later drawing the principal findings together for intergroup comparison, rather than to attempt to present the results for the entire 223 items in serial order. Only a minimum of material has been included here from the viewpoint of the categories as sub-scales. As a further guide the following directory is provided for convenience in locating the data on any particular item; the maladjusted answer (Y or N) is indicated following each question throughout:



Y	Y	N	Y	Y	Y	Y	N	N	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	
Fa	So	Pa	Ph	Ex	Ph	Ex	Fa	Fa	So	So	Fa	Ph	Ph	So	Fa	So	Fa	So	Ph	So	Ph	Ph	Fa	Fa	Ph	Ph	Fa	So	Ph	Ph	Pa	Ph	Fa	Fa	Pa	Sx	Ph
186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	N	Y	Y	
Fa	So	Fa	Ph	Fa	Ph	Ph	Fa	So	Fa	Pa	Ph	So	Ph	Ph	Fa	Pa	Ph	Ex	Fa	So	Ex	Sx	Sx	So	Fa	Ph	Ph	Fa	So	Ph	So	So	Ex	Fa	Fa		
149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	
N	N	Y	N	N	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	
So	Fa	Fa	So	So	Ph	Ex	So	So	Ex	Pa	So	Fa	Sx	So	Fa	Sx	Fa	Sx	So	Ph	Ph	Pa	Ph	Fa	Sx	So	Fa	So	Fa	Fa	Ph	So	Ex	Pa	Fa		
112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	
Y	N	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	
Fa	Fa	Pa	Ph	Fa	So	Pa	Ph	So	Fa	Fa	Fa	Ph	Ph	So	Ph	So	Fa	Ph	So	Sx	Ex	Fa	So	So	So	Fa	Pa	Fa	Fa	Fa	Fa	Pa	Fa	Ph	Ph	Fa	
75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	
N	Y	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y		
Ex	Fa	Fa	So	Ph	So	So	Pa	Ex	Fa	Ph	Ph	Ph	Fa	Fa	Fa	Ex	Fa	Ph	So	Fa	Ex	Ph	So	Ph	Fa	Fa	Fa	Ph	So	Sx	Pa	So	Fa	So	Fa	Fa	
38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
Y	N	Y	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	
So	So	So	Pa	Ph	Fa	Ph	Pa	Ph	So	Fa	So	So	Ex	So	Fa	So	So	Fa	Ex	Pa	Fa	Fa	So	Fa	Ph	So	Sx	So	Fa	Ex	So	Ph	Fa	So	Ph		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	

*Fantasy.* The following 72 items may be differentiated from the rest of the scale as referring to the inner experience of the subject:

- 6 Do you feel that life is a great burden?
- 11 Do you think most people are self-seeking or malicious?
- 16 Do you worry too long over humiliating experiences?
- 19 Are your day-dreams about improbable occurrences?
- 21 Do you often feel lonesome, even when you are with other people?
- 23 Do you consider yourself a rather nervous person?
- 24 Are you afraid of falling when you are on a high place?
- 26 Do a great many things frighten you?
- 31 Do ideas often run through your head so that you cannot sleep?
- 35 Are you ever bothered by a feeling that things are not real?
- 39 Are you frequently burdened by a sense of remorse?
- 40 Do people think you are selfish?
- 47 Do you worry over possible misfortunes?
- 51 Does it make you uneasy to go into a tunnel or subway?
- 52 Do your feelings alternate between happiness and sadness without apparent reason?
- 53 Are you often afraid of contracting disease?
- 55 Are you frequently worried about religion?
- 58 Have you ever been afraid of going insane?
- 63 Are you often frightened in the middle of the night?
- 64 Does it make you uneasy to sit in a small room with the door shut?
- 65 Have you ever seen a vision?
- 71 Did you ever have a strong desire to commit suicide?
- 73 Do you day-dream frequently?
- 74 Did you have a happy childhood?
- 75 Have you occasionally had to resist an impulse to take things that were not yours?
- 76 Have you ever been afraid that you might jump off when you were on a high place?
- 79 Do you get discouraged easily?
- 84 Does it make you uneasy to cross a bridge over a river?
- 85 Do your interests change quickly?
- 86 Did you ever have a strong desire to run away from home?
- 92 Do you dread the sight of a snake?
- 97 Have you ever felt as if someone were hypnotizing you and making you act against your will?
- 101 Have you had a strong impulse to go and set fire to something?
- 103 Are your day-dreams usually about unpleasant things?
- 104 Can you do the little chores of the day without worrying over them?
- 105 Were you happy when 14 to 18 years old?
- 106 Are you afraid when you have to take drugs?
- 108 Does your mind often wander badly so that you lose track of what you are doing?
- 111 Do you frequently talk to yourself?
- 113 Are you absent minded?
- 114 Do you have a great fear of fire?
- 124 Have you ever been depressed because of low marks in school?
- 127 Are you touchy on various subjects?
- 129 Are you troubled by thoughts of death?
- 136 Are you often in a state of excitement?

- 139 Do you frequently feel grouchy?  
 141 Can you stand the sight of blood?  
 142 Are you usually in good spirits?  
 148 Do things often go wrong for you by no fault of your own?  
 149 Do you think you know yourself well from having observed your own mind?  
 151 Do you ever have a queer feeling as if you were not your old self?  
 153 Does some particular useless thought keep coming into your mind to bother you?  
 156 Are you a "crank" about food?  
 158 Do you get upset easily?  
 164 Do you frequently feel that you deserve a better lot than you have?  
 168 Are you frequently in low spirits?  
 174 Do you feel that you are not satisfactorily adjusted to life?  
 177 Do you often experience periods of loneliness?  
 184 Do you lack self-confidence?  
 185 At night are you frequently troubled by the idea that somebody is following you?  
 186 Do you think you are usually unlucky?  
 193 Do you usually keep in fairly uniform spirits?  
 194 Are you frightened by lightning?  
 197 Do you feel you must do a thing over several times before you leave it?  
 199 Does it make you uneasy to have to cross a wide street or open square?  
 201 Are you troubled with feelings of inferiority?  
 202 Do you often find that you cannot make up your mind until the time for action has passed?  
 206 Do you have ups and downs in mood without apparent cause?  
 211 Have you ever lost your memory for a time?  
 214 Are you slow in making decisions?  
 219 Are you frequently troubled with the fear of being crushed in a crowd?  
 220 Are you in general self-confident about your abilities?

The following are the percentages of each sex answering each of the above items in the maladjusted manner ("incidence"); the standard error of any difference is about 6%. Incidences are included from two approximately comparable student groups, Harvey's Texas sophomores (male), and the Pittsburgh freshman women:

	6	11	16	19	21	23	24	26	31	35
Husbands	7	14	44	32	16	27	36	2	36	12
Wives	5	5	57	31	26	43	57	14	34	21
Male students	8	30	50	44	46	29	34	3	43	24
Female students	8	11	49	33	46	24	45	12	61	38
	39	40	47	51	52	53	55	58	63	64
Husbands	14	22	24	3	16	14	1	9	1	1
Wives	27	17	29	14	39	16	8	20	13	5
Male students	23	13	24	3	46	22	20	14	0	7
Female students	22	12	28	8	39	12	15	7	13	12

	65	71	73	74	75	76	79	84	85	86
Husbands	5	9	36	13	20	21	18	3	15	18
Wives	5	18	37	17	18	29	37	16	22	20
Male students	7	8	59	8	32	13	31	4	45	27
Female students	7	10	59	7	4	19	30	10	34	19
	92	97	101	103	104	105	106	108	111	113
Husbands	20	1	1	7	4	18	1	10	17	35
Wives	37	5	1	4	15	26	5	15	18	26
Male students	25	6	2	4	6	10	6	28	17	24
Female students	46	11	3	3	5	8	15	23	10	9
	114	124	127	129	136	139	141	142	148	149
Husbands	6	17	10	7	13	26	11	7	13	13
Wives	18	22	22	12	28	29	16	9	13	22
Male students	8	55	28	7	20	36	5	7	32	18
Female students	22	38	21	10	38	28	18	6	40	14
	151	153	156	158	164	168	174	177	184	185
Husbands	11	9	10	13	22	14	14	12	28	1
Wives	22	14	6	31	13	15	21	31	48	7
Male students	35	27	15	16	25	29	21	45	34	4
Female students	45	24	24	17	21	17	16	40	26	12
	186	193	194	197	199	201	202	206	211	214
Husbands	5	12	6	18	1	25	20	20	2	34
Wives	3	20	31	10	14	40	29	35	3	36
Male students	21	25	7	18	5	31	35	40	1	27
Female students	17	13	22	32	19	28	38	41	3	36
	219	220								
Husbands	1	16								
Wives	2	39								
Male students	1	20								
Female students	3	31								

The following are the distributions for these percentages:

	0	5	10	15	20	25	30	35	40	45
Husbands	14	11	18	10	8	4	2	4	1	0
Wives	5	10	9	12	10	9	6	6	2	1
Male students	9	14	4	5	10	10	8	2	3	4
Female students	5	9	14	10	9	4	5	6	3	5
	50	55	60	M	$\sigma$					
Husbands	0	0	0	14.3	10.3					
Wives	0	2	0	21.0	12.6					
Male students	1	2	0	21.5	14.8					
Female students	0	1	1	21.9	14.3					



Separating the items into low, medium, and high incidence groups gives the following:

#### *Husbands*

*Low*—55 worried about religion (1%), 63 frightened in night (1%), 64 uneasy, small room (1%), 97 being hypnotized (1%), 101 impulse, set fire (1%), 106 afraid of drugs (1%), 185 being followed (1%), 199 uneasy crossing street (1%), 219 fear of crushing, crowd (1%), 26 frightened (2%), 211 lost memory (2%), 84 uneasy over river (3%), 51 uneasy in tunnel (3%), 104 chores without worrying (4%), 65 seen vision (5%), 186 unlucky (5%), 114 fear of fire (6%), 194 frightened by lightning (6%), 6 life a burden (7%), 103 day-dreams unpleasant (7%), 129 thoughts of death (7%), 142 good spirits (7%), 58 afraid of insanity (9%), 71 desire for suicide (9%), 153 particular useless thought (9%), 108 mind wanders (10%), 127 touchy (10%), 156 food "crank" (10%), 141 stand blood (11%), 151 not old self (11%), 35 things unreal (12%), 193 uniform spirits (12%), 177 loneliness (12%), 74 happy childhood (13%), 136 excitement (13%), 148 things go wrong (13%), 149 know self well (13%), 158 upset easily (13%), 174 not adjusted (14%), 11 think people self-seeking (14%), 39 remorse (14%), 53 afraid of disease (14%), 168 low spirits (14%), 85 interests change (15%), 21 lonesome (16%), 52 feelings alternate (16%), 220 confident about abilities (16%), 124 depressed, low marks (17%), 111 talk to self (17%), 79 discouraged (18%), 86 desire, run away (18%), 105 happy adolescence (18%), 197 need to repeat (18%).

*Medium*—75 impulse to steal (20%), 92 dread snake (20%), 202 can't make up mind (20%), 206 mood swings (20%), 76 afraid, high place (21%), 40 thought selfish (22%), 164 deserve better (22%), 47 worry, possible misfortunes (24%), 201 inferiority feelings (25%), 139 grouchy (26%), 23 nervous (27%), 184 lack self-confidence (28%), 19 day-dreams improbable (32%), 214 slow in decisions (34%), 113 absent minded (35%), 73 frequent day-dreams (36%), 31 ideas banish sleep (36%), 24 afraid of falling (36%), 16 worry over humiliation (44%).

#### *Wives*

*Low*—101 impulse, set fire (1%), 219 fear crushing, crowd (2%), 186 unlucky (3%), 211 lost memory (3%), 103 day-dreams unpleasant (4%), 6 life a burden (5%), 11 think people self-seeking (5%), 64 uneasy, small room (5%), 65 seen vision (5%), 97 being hypnotized (5%), 106 afraid of drugs (5%), 156 food "crank" (6%), 185 being followed (7%), 55 worried about religion (8%), 142 good

spirits (9%), 197 need to repeat (10%), 129 thoughts of death (12%), 63 frightened in night (13%), 148 things go wrong (13%), 164 deserve better (13%), 26 frightened (14%), 51 uneasy in tunnel (14%), 153 particular useless thought (14%), 199 uneasy crossing street (14%), 104 chores without worrying (15%), 108 mind wanders (15%), 168 low spirits (15%), 53 afraid of disease (16%), 84 uneasy over river (16%), 141 stand blood (16%), 40 thought selfish (17%), 74 happy childhood (17%), 71 desire for suicide (18%), 75 impulse to steal (18%), 111 talk to self (18%), 114 fear of fire (18%).

*Medium*—58 afraid of insanity (20%), 86 desire, run away (20%), 193 uniform spirits (20%), 35 things unreal (21%), 174 not adjusted (21%), 85 interests change (22%), 124 depressed, low marks (22%), 127 touchy (22%), 149 know self well (22%), 151 not old self (22%), 21 lonesome (26%), 105 happy adolescence (26%), 113 absent minded (26%), 39 remorse (27%), 136 excitement (28%), 47 worry, possible misfortunes (29%), 76 afraid, high place (29%), 201 inferiority feelings (29%), 202 can't make up mind (29%), 19 improbable day-dreams (31%), 158 upset easily (31%), 177 loneliness (31%), 194 frightened by lightning (31%), 31 ideas banish sleep (34%), 206 mood swings (35%), 214 slow in decisions (36%), 13 day-dream frequently (37%), 79 discouraged (37%), 92 dread snake (37%), feelings alternate (39%), 220 confident about abilities (39%), 201 inferiority feelings (40%), 23 nervous (43%).

*High*—184 lack self-confidence (48%), 16 worry over humiliation (57%), 24 afraid of falling (57%).

#### *Male students*

*Low*—63 frightened in night (0), 211 lost memory (1%), 219 fear crushing, crowd (1%), 101 impulse, set fire (2%), 26 frightened (3%), 51 uneasy in tunnel (3%), 84 uneasy over river (4%), 103 day-dreams unpleasant (4%), 185 being followed (4%), 141 stand blood (5%), 199 uneasy crossing street (5%), 97 being hypnotized (6%), 104 chores without worrying (6%), 106 afraid of drugs (6%), 64 uneasy, small room (7%), 65 seen vision (7%), 129 thoughts of death (7%), 142 good spirits (7%), 194 frightened by lightning (7%), 6 life a burden (8%), 71 desire for suicide (8%), 74 happy childhood (8%), 114 fear of fire (8%), 105 happy adolescence (10%), 40 thought selfish (13%), 76 afraid, high place (13%), 58 afraid of insanity (14%), 156 food "crank" (15%), 158 upset easily (16%), 111 talk to self (17%), 149 know self well (18%), 197 need to repeat (18%).

*Medium*—55 worried about religion (20%), 136 excitement (20%), 220 confident about abilities (20%), 174 not adjusted (21%), 186 unlucky (21%), 53 afraid of disease (22%), 39 remorse (23%), 35 things unreal (24%), 47 worry, possible misfortunes (24%), 113 absent minded (24%), 92 dread snake (25%), 164 deserve better (25%), 193 uniform spirits (25%), 86 desire, run away (27%), 153 particular useless thought (27%), 214 slow in decisions (27%), 108 mind wanders (28%), 127 touchy (28%), 23 nervous (29%), 168 low spirits (29%), 11 think people self-seeking (30%), 201 inferiority feelings (31%), 79 discouraged (31%), 75 impulse to steal (32%), 148 things go wrong (32%), 24 afraid of falling (34%), 184 lack self-confidence (34%), 151 not old self (35%), 202 can't make up mind (35%), 139 grouchy (36%), 19 improbable day-dreams (40%), 206 mood swings (40%), 31 ideas banish sleep (43%).

*High*—85 interests change (45%), 177 loneliness (45%), 21 lonesome (46%), 52 feelings alternate (46%), 16 worry over humiliation (50%), 124 depressed, low marks (55%), 73 day-dream frequently (59%).

*Female students*

*Low*—101 impulse, set fire (3%), 103 unpleasant day-dreams (3%), 211 lost memory (3%), 219 fear crushing, crowd (3%), 75 impulse to steal (4%), 104 chores without worrying (5%), 142 good spirits (6%), 58 afraid of insanity (7%), 65 seen vision (7%), 74 happy childhood (7%), 6 life a burden (8%), 51 uneasy in tunnel (8%), 105 happy adolescence (8%), 113 absent-minded (9%), 71 desire for suicide (10%), 84 uneasy over river (10%), 111 talk to self (10%), 129 thoughts of death (10%), 11 think people self-seeking (11%), 97 being hypnotized (11%), 26 frightened (12%), 40 thought selfish (12%), 53 afraid of disease (12%), 64 uneasy, small room (12%), 185 being followed (12%), 63 frightened in night (13%), 193 uniform spirits (13%), 149 know self well (14%), 55 worried about religion (15%), 106 afraid of drugs (15%), 174 not adjusted (16%), 158 upset easily (17%), 168 low spirits (17%), 186 unlucky (17%), 141 stand blood (18%), 76 afraid, high place (19%), 86 desire, run away (19%), 199 uneasy crossing street (19%).

*Medium*—127 touchy (21%), 164 deserve better (21%), 39 remorse (22%), 114 fear of fire (22%), 194 frightened by lightning (22%), 108 mind wanders (23%), 23 nervous (24%), 153 particular useless thought (24%), 156 food "crank" (24%), 184 lack self-confidence (26%), 47 worry, possible misfortunes (28%), 139 grouchy (28%), 201 inferiority feelings (28%), 79 discouraged (30%), 220 confident about abilities (31%), 197 need to repeat (32%), 19 day-dreams im-

probable (33%), 85 interests change (34%), 214 slow in decisions (36%), 35 things unreal (38%), 124 depressed, low marks (38%), 136 excitement (38%), 202 can't make up mind (38%), 52 feelings alternate (39%), 148 things go wrong (40%), 177 loneliness (40%), 206 mood swings (41%).

*High*—24 afraid of falling (45%), 151 not old self (45%), 21 lonesome (46%), 92 dread snake (46%), 16 worry over humiliation (49%), 73 day-dream frequently (59%), 31 ideas banish sleep (61%).

The following are the differences by serial number:

	6	11	16	19	21	23	24	26	31	35	39	40
H—W	2	9	—13	1	—10	—19	—21	—12	2	—9	—13	5
H—MS	—1	—16	—6	—8	—30	—2	2	—1	—7	—12	—9	9
W—FS	—3	—6	8	—2	—20	19	12	2	—27	—17	5	5
MS—FS	0	19	1	11	0	5	—11	—9	—18	—14	1	1
	47	51	52	53	55	58	63	64	65	71	73	74
H—W	—5	—11	—23	—2	—7	—11	—12	—4	0	—9	—1	—4
H—MS	0	0	—30	—8	—19	—5	1	—6	—2	1	—23	5
W—FS	1	6	0	4	—7	13	0	—7	—2	8	—22	10
MS—FS	—4	—5	7	10	5	7	—13	—5	0	—2	0	1
	75	76	79	84	85	86	92	97	101	103	104	105
H—W	2	—8	—19	—13	—7	—2	—17	—4	0	3	—11	—12
H—MS	—12	8	—13	—1	—30	—9	—5	—5	—1	3	—2	8
W—FS	14	10	7	6	—11	1	—9	—6	—2	1	10	18
MS—FS	28	—6	1	—6	11	8	—21	—5	—1	1	1	2
	106	108	111	113	114	124	127	129	136	139	141	142
H—W	—4	—5	—1	9	—12	5	—12	—5	—15	—3	—5	—2
H—MS	—5	—12	0	11	—2	—38	—18	0	—7	—10	6	0
W—FS	—10	—8	8	17	—4	—16	1	2	—10	1	—2	3
MS—FS	—9	5	7	15	—14	17	7	—3	—18	8	—13	1
	148	149	151	153	156	158	164	168	174	177	184	185
H—W	0	—9	—11	—5	4	—18	9	—1	—7	—19	—20	—6
H—MS	—19	—5	—24	—22	—5	—3	—3	—15	—7	—33	—6	—3
W—FS	—27	8	—23	—10	—18	14	—8	—2	5	—9	22	—5
MS—FS	—8	4	—1	3	—9	—1	4	12	5	5	8	—8
	186	193	194	197	199	201	202	206	211	214	219	220
H—W	2	—8	—25	8	—13	—15	—9	—15	—1	—12	—1	—23
H—MS	—16	—13	—1	0	—4	—6	—15	—20	1	7	0	—4
W—FS	—14	7	9	—22	—5	12	—9	—6	0	0	—1	—2
MS—FS	4	12	—16	—14	—14	3	—3	—1	—2	—9	—2	—11



The distributions of differences are as follows:

	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
H—W	0	0	0	4	6	17	10	19	10	6	0	0
H—MS	1	1	3	3	6	7	11	20	12	7	1	0
W—FS	0	0	2	3	4	2	13	11	13	12	8	3
MS—FS	0	0	0	1	2	9	9	13	17	12	5	3

	20	25	M	$\sigma$
H—W	0	0	-6.9	8.0
H—MS	0	0	-6.7	10.4
W—FS	1	0	-1.1	11.0
MS—FS	0	1	-.4	9.4

We may split off items with more than 10% (10% and over on the plus side and over 10% on the minus side, since the index is the lower limit of the class) difference in either direction, thereby learning what kind of situation results in pronounced differences in neurotic attitudes. A divergence of 10% would correspond to odds of about 19 to 1 in favor of a true difference. The wives are not better adjusted than the husbands in any item, on this criterion.

The husbands are better adjusted than the wives in

- 194 frightened by lightning (*d* 25%)
- 52 feelings alternate (*d* 23%)
- 220 confident about abilities (*d* 23%)
- 24 afraid of falling (*d* 21%)
- 184 lack self-confidence (*d* 20%)
- 23 nervous (*d* 19%)
- 79 discouraged (*d* 19%)
- 177 loneliness (*d* 19%)
- 158 upset easily (*d* 18%)
- 92 dread snake (*d* 17%)
- 136 excitement (*d* 15%)
- 201 inferiority feelings (*d* 15%)
- 206 mood swings (*d* 15%)
- 16 worry over humiliation (*d* 13%)
- 39 remorse (*d* 13%)
- 84 uneasy over river (*d* 13%)
- 199 uneasy crossing street (*d* 13%)
- 26 frightened (*d* 12%)
- 63 frightened in night (*d* 12%)
- 105 happy adolescence (*d* 12%)
- 114 fear of fire (*d* 12%)
- 127 touchy (*d* 12%)
- 214 slow in decisions (*d* 12%)
- 51 uneasy in tunnel (*d* 11%)
- 58 afraid of insanity (*d* 11%)
- 104 chores without worrying (*d* 11%)
- 151 not old self (*d* 11%)

The male students are better adjusted than the husbands in

113 absent minded (*d* 11%)

The husbands are better adjusted than the male students in

124 depressed, low marks (*d* 38%)

177 loneliness (*d* 33%)

21 lonesome (*d* 30%)

52 feelings alternate (*d* 30%)

85 interests change (*d* 30%)

151 not old self (*d* 24%)

73 day-dream frequently (*d* 23%)

153 particular useless thought (*d* 22%)

206 mood swings (*d* 20%)

55 worried about religion (*d* 19%)

148 things go wrong (*d* 19%)

127 touchy (*d* 18%)

11 think people self-seeking (*d* 16%)

186 unlucky (*d* 16%)

168 low spirits (*d* 15%)

202 can't make up mind (*d* 15%)

79 discouraged (*d* 13%)

193 uniform spirits (*d* 13%)

35 things unreal (*d* 12%)

75 impulse to steal (*d* 12%)

108 mind wanders (*d* 12%)

The female students are better adjusted than the wives in

184 lack self-confidence (*d* 22%)

23 nervous (*d* 19%)

105 happy adolescence (*d* 18%)

113 absent-minded (*d* 17%)

75 impulse to steal (*d* 14%)

158 upset easily (*d* 14%)

58 afraid of insanity (*d* 13%)

24 afraid of falling (*d* 13%)

201 inferiority feelings (*d* 12%)

74 happy childhood (*d* 10%)

76 afraid, high place (*d* 10%)

104 chores without worrying (*d* 10%)

The wives are better adjusted than the female students in

31 ideas banish sleep (*d* 27%)

148 things go wrong (*d* 27%)

151 not old self (*d* 23%)

73 day-dream frequently (*d* 22%)

197 need to repeat (*d* 22%)

21 lonesome (*d* 20%)

156 food "crank" (*d* 18%)

35 things unreal (*d* 17%)

124 depressed, low marks (*d* 16%)

186 unlucky (*d* 14%)

85 interests change (*d* 11%)

The female students are better adjusted than the male students in

- 75 impulse to steal (*d* 28%)
- 11 think people self-seeking (*d* 19%)
- 124 depressed, low marks (*d* 17%)
- 113 absent-minded (*d* 15%)
- 168 low spirits (*d* 12%)
- 193 uniform spirits (*d* 12%)
- 19 day-dreams improbable (*d* 11%)
- 85 interests change (*d* 11%)
- 53 afraid of disease (*d* 10%)

The male students are better adjusted than the female students in

- 92 dread snake (*d* 21%)
- 31 ideas banish sleep (*d* 18%)
- 136 excitement (*d* 18%)
- 194 frightened by lightning (*d* 15%)
- 35 things unreal (*d* 14%)
- 114 fear of fire (*d* 14%)
- 197 need to repeat (*d* 14%)
- 199 uneasy crossing street (*d* 14%)
- 63 frightened in night (*d* 13%)
- 141 stand blood (*d* 13%)
- 24 afraid of falling (*d* 11%)
- 220 confident about abilities (*d* 11%)

(To be continued.)

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## LA NÉVROSE DANS LE MARIAGE: I, II

## (Résumé)

Le problème a été de déterminer l'incidence approximée et quelques renseignements sur l'association des traits névrosiques dans le mariage; la section présente rapporte l'incidence totale comparée à celle des populations universitaires du même état social, l'incidence par catégories de tendance névrosique, et l'incidence des points de tendance névrosique compris dans la catégorie nommée points de "fantaisie". L'outil employé a été l'Echelle de Personnalité de Thurstone, et les sujets ont été des mariés des niveaux social-économiques supérieurs, au nombre de 152.

La population mariée s'est montrée définitivement plus névrosique que les populations universitaires supposées être comparables, et cela est vrai pour les deux sexes. Dans la groupe des mariés et le groupe universitaire les femmes se sont montrées plus névrosiques que les hommes, et cette différence de sexe a été plus grande pour le groupe des mariés. Ces différences se réfléchissent dans les six catégories en lesquelles on a divisé l'échelle. Les catégories "sociale" et "fantaisie" ont produit le plus de névroses chez les femmes, et les catégories "sociale" et "extrovertie" (attitudes à l'égard du milieu non humain) chez les maris; les catégories "sexé" et "physique" ont produit le moins de névroses chez les deux sexes. Les pourcentages des incidences sont donnés (et varient de beaucoup) pour les points de la catégorie "fantaisie", et on a formé des groupes de ces points qui montrent une différence de plus de 10% entre le groupe des mariés et celui des non mariés et entre le groupe des mâles et celui des femelles.

WILLOUGHBY

## NEUROTIZISMUS IN DER EHE (I, II)

## (Referat)

Das Problem bestand darin, das ungefähre Vorkommen (incidence) und etwas über die Verbindung neurotischer Züge in der Ehe zu bestimmen; der vorliegende Teil berichtet über das Vorkommen im Grossen und Ganzen verglichen mit demjenigen der Collegebevölkerung gleicher sozialer Stellung, das Vorkommen in Kategorien neurotischer Tendenzen, und das Vorkommen von Angaben neurotischer Tendenzen, die in der Kategorie der sogenannten "Phantasie"-Angaben enthalten sind. Das dazu gebrauchte Mittel war das Thurstonesche Persönlichkeitsverzeichnis (Thurstone Personality schedule), und die Versuchspersonen waren verheiratete Paare der höheren sozialökonomischen Stände, bis zu einer Zahl von 152.

Die verheiratete Bevölkerung erwies sich als bestimmt neurotischer als die mutmasslich vergleichbare Collegebevölkerung; das traf für beide Geschlechter zu. In beiden Gruppen, der Verheirateten sowohl wie der Collegestudenten waren die Frauen neurotischer als die Männer, und diese Geschlechtsunterschiede spiegeln sich in den sechs Kategorien wieder, in die das zur Messung dienende Verzeichnis geteilt war. "Soziale"- und "Phantasie"-Kategorien brachten am meisten Neurotizismus bei den Frauen hervor, und "soziale" und "extroverte" (Haltungen gegenüber nicht-menschlicher Umgebung) bei den Männern; "Geschlechts"- und



“physische” Kategorien am wenigsten bei beiden Geschlechtern. Es werden die Prozente des Vorkommens (die stark variieren) für die Angaben der “Phantasie”-Kategorie angegeben, und Gruppen werden für diejenigen Angaben aufgestellt, die mehr als 10% Unterschied zwischen den Verheirateten und ledigen und männlichen und weiblichen Gruppen aufweisen.

WILLOUGHBY

## JUDGING PERSONALITY FROM VOICE\*

*From the Psychological Laboratory of Harvard University*

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G. W. ALLPORT AND H. CANTRIL

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Each member of an ordinary congregate audience receives a clear impression of the personality of the speaker. Complex visual perceptions of his physical build, posture, clothes, and movements, in addition to auditory perceptions derived from his speech and voice, make this impression seem accurate and complete. Over the radio the rich and informative visual pattern is absent; only the voice and speech remain. The resulting judgment is somewhat fragmentary and uncertain. This situation has already received popular recognition in jokes concerning the disillusionment of those who learn to their sorrow that the radio voice with which they fell in love does not reveal accurately either the appearance or the nature of its possessor.

In spite of such hazards, however, probably most people who listen to radio speakers feel assured that some of their judgments are dependable. Often the impression is nothing more than a feeling of favor or aversion, but sometimes it represents a surprisingly definite judgment concerning the speaker's physical, intellectual, and moral qualities. One broadcasting official asserts: "The human voice, when the man is not making conscious use of it by way of impersonation, does in spite of himself reflect his mood, temper and personality. It expresses the character of the man. President Roosevelt's voice reveals sincerity, good-will and kindness, determination, conviction, strength, courage and abounding happiness."<sup>1</sup> Such statements, even when made with authority, require proof. It is plainly a problem for the psychologist to determine how accurate, on the average, such judgments are.

In spite of its obviousness and accessibility, the problem of judging personality by the radio voice has as yet received very little at-

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<sup>1</sup>*New York Times Magazine*, June 18, 1933.

tention. T. H. Pear (4) has made an auspicious beginning with the assistance of the British Broadcasting Company. Using nine speakers of different ages, sex, and interests, he secured over 4000 listeners' judgments concerning the vocation, place of residence, age, and birthplace of these speakers. Although Pear's chief interest was in such phonetic problems as accent and dialect, the free descriptions submitted by the auditors enabled him to make some tentative statements concerning the accuracy of judgments of other personal characteristics. Sex was stated correctly (except in the case of an eleven-year-old child); age, in spite of a strong central tendency in the judgments, was on the whole estimated with fair success. Physical descriptions seemed frequently to be apt, and vocation was sometimes stated with surprising exactness. Since Pear did not prescribe the manner in which the judgments should be made or instruct the listeners concerning all of the features of personality which they might judge, his results are difficult to express quantitatively or to compare with chance.

The distinction drawn by Sapir (5) between *voice* and *speech* is important in research of this type. Voice is expressive movement, an individual pattern composed of such inextricable factors as pitch, rhythm, intensity, inflection, volume, and vocal mannerisms. Voice is, in brief, the external *form* of vocal expression. Speech, on the other hand, is its *content*. The subject-matter of the discourse, the vocabulary employed, the language or dialect spoken, the grammatical structure of the sentences, and the style of composition, are all peculiarities of *speech*. They are determined in large part by the cultural background of the speaker, and furnish considerable information useful in classifying him as a member of certain racial, regional, or educational groups. It is true that in everyday life we judge a man by what he says and by his cultural affiliations quite as much as by his own individual vocal characteristics, but in research concerned with voice alone it is essential that all other cues be excluded or held constant. The same requirement confronts the psychologist working with handwriting. If individual differences in chirography alone are the object of the investigation, the context and subject-matter, the quality of the stationery, and mistakes in spelling must not be permitted to furnish an extra basis of judgment.

The ten experiments described below were all designed to determine to what extent the unanalyzed natural *voice* is a valid indica-

tor of various features of personality.<sup>2</sup> Certain precautions were taken to exclude the cues which might arise from individual differences in *speech*. Inasmuch as uniform material was read from type-written texts, differences in vocabulary, fluency of speech, grammatical accuracy, and subject-matter were virtually eliminated. Except in the case of one speaker (a native of South Africa) there were no appreciable differences in accent among our broadcasters.

No attempt was made to analyze voice into its various attributes, as Michael and Crawford (3) and Sapir (5) have suggested. To attempt to correlate pitch with one personal quality, speed with another, and intensity with a third, would be to make the whole problem absurdly atomistic, and, as is the case with all studies which seek correlations between mere meaningless fragments of well-structured personalities, the study would be foredoomed to failure.<sup>3</sup>

### THE METHOD

In the main part of the investigation eight separate experiments were performed. Six of these took place in the Harvard Psychological Laboratory where a complete broadcasting and receiving unit had been installed. The other two experiments were conducted from the broadcasting studio of Station WEEI in Boston.<sup>4</sup> In the six laboratory experiments students acted as judges, the number in the different experiments ranging from 32 to 85. In the two WEEI experiments, the public was asked to send in judgments. From one of these appeals 190 replies were received; from the other, 95. The total number of judges participating in these eight experiments was 587. The procedure employed in each of the laboratory experiments (I-VI) and in the two studio experiments (VII-VIII) was practically identical.

Certain features of personality which could be reliably measured

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<sup>2</sup>A preliminary account of this research was reported at the Tenth International Congress of Psychology (Copenhagen) and has been published in *Education on the Air*, Columbus, Ohio State Univ., 1932. Pp. 304-310.

<sup>3</sup>Cf. G. W. Allport (1).

<sup>4</sup>The authors wish to express their appreciation to The Edison Electric Illuminating Company of Boston for the use of their studio, and for the generous loan and installation of the apparatus employed in the laboratory experiments. They are likewise indebted to the numerous speakers and judges who participated in these studies, and especially to their associates and helpers, Mr. F. T. Brown and Mr. C. E. Smith.



or otherwise determined objectively were selected for study. The features chosen ranged from such definite physical attributes as age and height to certain complex traits and interests of the "inner" personality. The meanings of two semi-technical expressions (extroversion-introversion and ascendance-submission) were carefully explained to the judges. In each of the eight experiments several of the following features of personality appeared.

*Physical and Expressive Features* ("Outer" Characteristics)

1. age
2. height
3. complexion
4. appearance in photographs
5. appearance in person
6. handwriting

*Interests and Traits* ("Inner" Characteristics)

7. vocation
8. political preference
9. extroversion-introversion
10. ascendance-submission
11. dominant values
12. Summary sketch

Three speakers were selected for each of these eight experiments. Eighteen different speakers took part; twelve participated only once, and six participated in two experiments. All of the speakers were male. In general, a diversity of voices and personalities was sought, although extreme eccentricities or abnormalities were avoided. Before each experiment, objective information for each speaker was obtained on all of the features included in that experiment. The objective criteria for the first eight features are obviously gathered from direct measurement, observation, or questioning. The criterion for extroversion-introversion was the Heidbreder scale; for ascendance-submission, the Allport *A-S Reaction Study*; for dominant values, the Allport and Vernon *Study of Values*.

For experiments involving the matching of voice with handwriting or with appearance in photographs, slides were made of uniform samples and projected upon the screen for the duration of the experiment. Three photographs or three samples of handwriting would remain upon the screen while the three voices read their passages. For the experiments involving a matching of voice with appearance in person, simultaneous matching was impossible. After each reading all three of the speakers walked into the room where the audience was seated. An interval of perhaps half a minute

elapsed between the voice and the appearance of the three speakers. Each speaker wore a symbol pinned to his coat, which was employed by the judges in indicating their matching.

At the beginning of each of the eight experiments there was one practice reading of the same passage by each of the three speakers, to accustom the judges to the voices. The passages which were used in both the practice reading and in each portion of the experiment averaged approximately ten lines in length, and were selected from Dickens, Lewis Carroll, or similar sources.

In Experiments I-VI small record booklets were prepared for the judges, on each page of which the necessary information concerning one feature of personality was given. One page of the booklet, for example, appeared as follows:

Rating on a test for Ascendance-submission

Voice — very ascendant

Voice — slightly ascendant

Voice — very submissive

The subjects were instructed to match each of the three voices they would hear (designated as voice No. 1, voice No. 2, and voice No. 3) with the items of information given. The three speakers read the same passage in rotation and the judges entered beside each of the three items the number of the voice which the characterization seemed to fit best. The listeners were instructed to make independent judgments for each feature represented on the separate pages of the record booklet. In no case were they allowed to turn back or ahead.

The final part of each of these experiments consisted of matching the voices with three summary sketches based upon all the information previously given for each voice. The final page of the record booklet in Experiment V, for example, read as follows:

Voice—A teacher of physics who is very interested in acquiring knowledge and in business, but who has little religious interest. He is extremely submissive but neither extroverted nor introverted. He is 41 years old and six feet tall.

Voice—A supervisor of community centers who has social interest and likes power. He has very little artistic interest; is somewhat extroverted and slightly submissive. He is 51 years old and five feet eight inches tall.

Voice—An electrical engineer who is interested in business and

learning but is not religious. He is slightly introverted and slightly submissive. Thirty-one years old and five feet ten inches tall.

In Experiments VII and VIII (from Station WEEI) this procedure had to be modified somewhat. The announcer first instructed the auditors how to make out their own reply cards, and then before each portion of the experiment gave the necessary information concerning the three speakers. The procedure was not complicated, and the replies which were sent in showed virtually no confusion.

### RESULTS

Table 1 presents the results obtained in these eight experiments. All figures indicate the reliability of the percentage of the correct judgments. This reliability was determined by subtracting the theoretical percentage for chance matching (33%) from the percentage of correct responses obtained from the judges. This difference was then divided by the probable error of the percentage

(determined by the Yule formula,  $P.E. = .6745\sqrt{\frac{pq}{n}}$ ) (7, p. 337).

All quotients (here represented by the symbol  $Q$ ) which are four or over may be considered statistically "significant." All such quotients are boldfaced, and are positive unless otherwise indicated.

It can be seen from this table that 25 (44%) of the coefficients are significantly positive; four (7%) are significantly negative. Before drawing any conclusions, however, the results of matching each feature with voice should be inspected separately.

*Age.* The two experiments in which age was judged yielded positive results. In V the voices were matched to the ages given, while in VII the ages of the three speakers were merely estimated by the judges. The averages of the estimates in VII for the speakers were 25, 37, and 41 and the actual ages were 27, 36, and 51, respectively. There was thus a tendency to center the ages around a median of 35-40, corroborating Pear's discovery of a central tendency in judgments of age from voice.

*Height.* Herzog (2a) reported positive results in a study of the determination of height from voice.<sup>5</sup> Only one of our four experi-

<sup>5</sup>Herzog's study, recently published, also includes results on judgments of sex, age, vocation, and weight from voice. In general, they show that all these characteristics are judged more accurately than one would expect by chance.

TABLE 1  
RESULTS OF MATCHING VOICE WITH VARIOUS FEATURES OF PERSONALITY

Feature judged	I	(Laboratory)		Experiment number						(WEEI)	
		II	III	IV	V	VI	VII	VIII			
<i>Physical and expressive features</i>											
1. age			— 3.3		9.9				+		
2. height					4.3	—0.6			1.7		
3. complexion									4.6		
4. appearance in photographs	2.8	1.2	3.6	8.8	6.9						
5. appearance in person			— 2.8	1.0	6.0	2.8					
6. handwriting	1.9		0.9	2.1	0.7	—2.2					
<i>Interests and traits</i>											
7. vocation	— 2.8			6.4	—1.3	0.4	24.5		8.2		
8. political preferences	7.4		— 5.9	3.3					4.0		
9. extroversion-introversion	14.0	15.0	— 5.4	—3.1	—3.8	—0.8			19.2		
10. ascendance-submission	13.5	14.5	17.0	8.8	—4.8		— 8.7				
11. dominant values	7.4	6.0	— 3.3	0.2	8.0	0.3					
12. Summary sketch	14.7	13.5	— 2.0	5.7	8.8	0.9					
Number of judges	55	85	34	46	50	32	190		95		
Voice number 1	A	A	D	G	K	N	Q	J			
Voice number 2	B	B	E	H	L	O	R	H			
Voice number 3	C	C	F	J	M	P	S	M			



ments on height seems to support her finding. The comparatively large percentage of correct answers (45%) for this item in V was due primarily to the case of a short, fat man whose voice was thick, mellow, and "chuckling." By 60% of the listeners (instead of the 33% expected by chance) this voice was judged to belong to the shortest speaker.

*Complexion.* The only experiment which included this feature yielded somewhat significant results. Little confidence can be placed in this finding, however, until it is confirmed.

*Appearance in Photographs.* In all cases the results here are positive, and in two cases they are significantly so. The significant results in IV and V seem to be due chiefly to the distinctive appearance of one or two of the speakers in each experiment. For example, in IV, the photograph of speaker H, whose voice was correctly taken to be that of a poet, showed him with side-burns and a drawn, pointed face.

*Appearance in Person.* It seems illogical that the results here are not quite so positive as those obtained from the use of photographs. This deficiency may be due to the time which necessarily elapsed between hearing the voice and making the judgment, with the result that there was a fading-out or confusion in the image of the voice before the matching could be made.

*Handwriting.* This matching has special significance for the problem of the consistency or harmony of an individual's expressive movements (2). If the voice and the handwriting are both expressions of personality, should they not be matched with each other? Wolff (6) found that voices recorded by means of a gramophone were correctly matched with handwriting about one and a half times as frequently as would be expected by chance. Although this matching was tried in five laboratory experiments, none of the results is significant. Four of the quotients are positive, however, and only one negative. The failure to obtain higher results may be due chiefly to the fact that untrained judges were employed, skilled neither in the judgment of voices nor of handwriting.

*Vocation.* Three of the experiments yielded significantly positive quotients, while one was significantly negative. The largest coefficient of successful matching obtained in the entire series of experi-

ments came from the judgments of vocation made by 190 listeners in Experiment VII. In this experiment one speaker was an artist, one a business man, and one a professor. The coefficient of correct matching was +24.5. The negative results in III are also significant. Here one speaker was a professor of English, one a psychologist, and one a journalist. The psychologist, however, was a native of South Africa and had an apparently "English accent," and was therefore consistently judged to be a professor of English! It is evident that the auditors have decided opinions concerning the kinds of voices which are typical of the various professions. Such preconceptions are frequently, though by no means invariably, correct.

*Political Preferences.* Like the matching with photographs, the determination of political preference from voice seems to be rather surprisingly successful. In the cases where "significant" results were obtained, however, there were present in each group of speakers at least one or two distinctive voices which made matching easy. The "poetic" voice of H, for example, was usually taken as belonging to a *socialist*.

*Extroversion-Introversion.* In three experiments this matching was accomplished with signal success. The strikingly significant results were clearly due to the loud, boisterous, care-free voices which in these three experiments happened to fit the extroverts, and the gentle, restrained voices which happened to fit the introverts. In the other experiments, where slightly negative results were obtained, these vocal characteristics were either absent or else were actually deceptive. This extremely irregular result, very unlike chance, is quite typical of all our findings, and will be interpreted later.

*Ascendance-Submission.* Every result for these traits is significant, four markedly positive and two moderately negative. Here, as in extroversion-introversion, the distribution of results does not in the least resemble chance. The voice gives very decided indications of traits, often correctly, but sometimes incorrectly. The degrees of ascendance-submission of the speakers in the first four experiments correctly fit into the picture of the forceful, aggressive voice as opposed to the passive, meek voice; while in Experiment VII the great majority of the incorrect answers were due to the fact that the submissive professor had cultivated (for classroom purposes) a typically ascendant manner of speaking.

*Dominant Values.* In half the experiments the results were clearly positive and significant. In Experiment I two of the speakers were high in both aesthetic and religious interests (as measured by the *Study of Values*), and were often confused with each other. The positive result of this experiment is due therefore to the fact that these two speakers were scarcely ever mistaken for the third, whose voice clearly betrayed his political and economic interests.

*Summary Sketches.* The single features just enumerated were summarized for the judges into one final thumb-nail sketch of each speaker. The purpose of this final matching was to determine whether or not the voice reveals a *complex pattern* of personality better than a single feature. The results are positive. *A pattern of qualities seems, on the average, rather more correctly matched with voice than does any single quality.*

#### MATCHING FREE DESCRIPTIONS OF PERSONALITY WITH VOICE

In Experiments IV, V, VII, and VIII, the judges submitted free descriptions of the speakers to supplement their matchings. Many of these descriptions seemed even more accurate than the controlled judgments. The descriptions of six of the speakers were collated and arranged in the form of six brief sketches and employed in Experiment IX. All uncomplimentary and ambiguous items were deleted. Although such editing was to a certain extent arbitrary, each sketch was made to conform as faithfully as possible to the descriptions submitted. Qualities often mentioned were emphasized, and conflicting characterizations were proportionately included. Following is one of the final sketches employed.

Mr. A is characterized by his ascendant, aggressive behavior. He has drive and initiative, knows what he wants and gets it. He has decided opinions and likes to express them. He is extroverted, easily resists salesmen, and cares little what others think about him. He is wealthy and aristocratic, and has an appreciation of good literature.

Experiment IX was divided into two parts. In *Part I* three of the speakers participated. The radio audience was instructed by the station announcer that three speakers (voice A, voice B, and voice C) would read three descriptions (descriptions 1, 2, and 3) intended to describe the speakers, and that the radio audience should decide which description best characterized each speaker. The three speakers then

read description 1, each speaker ending the passage with the question, "Does this describe me?" Then description 2 was read by each speaker, and, finally, description 3. *Part II* was identical with *Part I* except that three other speakers and their corresponding descriptions were employed.

The number of answers (25) returned by the listeners was unfortunately small (Amos 'n Andy proving to be too great a competitor for science). The results, however, so far as they go, are significantly above chance in both parts of the experiment.

	<i>Q</i>
Part I	4.4
Part II	9.0

This experiment provides a kind of check upon the reliability of the impressions created by the six voices. Unlike Experiments I-VIII the judgments are not validated against objective criteria, but are compared with the judgments of other listeners who knew the speakers only by their voices. Whether the impressions are correct or incorrect, it is clear that they are essentially the same for *different* groups of listeners.

In a minor experiment (X) the free descriptions of the speakers sent in by the judges in Experiment VII were listed. The three lists of brief characterizations ("moody," "nervous," "precise," "dapper," etc.) were then mimeographed on separate sheets. Copies were distributed to friends and acquaintances and they were asked to decide which list best described the speaker or speakers whom they knew. Fifty-six judgments were received and 91% of these were correct.

### THE RADIO VOICE VERSUS THE NORMAL VOICE

In order to determine whether the mechanical transmission of voice reduces the ability of the judges to make correct matchings, several control presentations were introduced in some of the laboratory experiments. In these presentations, the speakers read behind a curtain in the same room where the subjects were seated. The same features which were matched with the radio voice were likewise judged in this situation.



TABLE 2  
COMPARATIVE RESULTS OF MATCHING RADIO VOICE AND NATURAL VOICE WITH  
VARIOUS FEATURES OF PERSONALITY

Feature judged	Radio voice		Normal voice	
	% correct	<i>Q</i>	% correct	<i>Q</i>
Experiment I*				
photograph	41	2.8	59	9.1
handwriting	38	1.9	44	3.6
vocation	27	-2.8	44	3.6
political	53	7.4	51	6.0
preference				
extroversion-	67	14.0	70	13.6
introversion				
ascendance-	62	13.5	63	10.6
submission				
dominant values	53	7.4	76	17.0
summary sketch	70	14.7	64	10.9
average	51		59	
Experiment II				
extroversion-	63	15.0	37	1.7
introversion				
ascendance-	62	14.5	75	23.0
submission				
dominant values	46	6.0	64	15.5
average	57		59	
Experiment V				
height	46	4.3	50	5.9
appearance	50	5.9	78	16.5
ascendance-	42	-4.8	63	2.9
submission†				
Experiment VI				
appearance	48	2.7	27	-1.2
average (Exps. V, VI)	46		55	
Average in all exps.	51		58	

\*In Experiment I, 54 judges participated in the radio presentation and 45 judged the normal voice.

†Since two of the speakers obtained the same rating, the chance percentage for this feature is 5/9 rather than 1/3.

The comparative analysis of the results in Table 2, based on data obtained in four experiments, shows that there is an average difference of about 7% in favor of the normal voice. To control the effect of practice the normal voice in some experiments was introduced before, and in others after, the voice had been heard over

the radio. The order of presentation makes no appreciable difference.

This finding has considerable theoretical and practical interest. From the theoretical point of view, it may be said that the listeners are quite successful in "hearing through" the inevitable burr which accompanies a mechanical transmission of the human voice. Adaptation to the change in the quality which a voice undergoes in such transmission seems to be remarkably rapid and thoroughgoing. Even the subtlest inflections may be successfully analyzed out from all extraneous sounds. The voice, as it were, becomes a distinct and well-identified figure upon the ground of subdued mechanical noise. (A very few people, however, seem incapable of negative adaption to the ground, and persistently complain of the distortion of the voices or musical instruments which they hear. Such people usually dislike the radio for aesthetic reasons.)

Even though the broadcaster can be assured that most people readily adapt to the figure-ground situation which the radio creates, our experiments do show a slight loss in the accuracy of matching. On the average, the natural voice is somewhat more revealing of personal qualities than is the radio voice. The loss represents perhaps only such imperfections in transmission which mechanical improvements in the radio may in time remove. It should be reported here that the apparatus employed in these experiments lacked the dynamic or condenser microphone found in the newest broadcasting equipment. Except for its two-button carbon microphone the equipment used was modern in every respect.

### CONCLUSIONS AND INTERPRETATIONS

This analysis of the results now enables us to answer the two fundamental questions with which the investigation is concerned.

1. *Does voice convey any correct information concerning outer and inner characteristics of personality?* The answer is *Yes*. Not only are the majority of our coefficients positive (74%), but 47% are "significantly" so, often by very large margins. If the judgments of the various features of personality were due entirely to chance we would, of course, expect an approximately equal number of positive and negative *Q*'s and a very smaller percentage of "significant" results.

2. *Is there uniformity in the expression of personality through voice*, so that it might be said that certain personality qualities are consistently revealed and others not at all; or that certain types of individuals are always revealed by their voices, and others never? The answer is *No*. Results which are exclusively positive and significant were obtained for no single feature excepting age and complexion (and repeated experiments would be necessary to establish their reliabilities). Nor were the results for all of the personal characteristics of any one of our eighteen speakers always positive and significant. Therefore, the only certain generalization that can be made is that by and large *many features of many personalities can be determined from voice*.

This general conclusion requires supplementation and interpretation through the following additional findings.

3. The fact that 53% of our coefficients are "significant" (either positive or negative) and the fact that only 14% fall within the range of  $\pm 1$  P.E. indicate that the judgments, even when they are erroneous, do not represent mere guesses. A voice seems to arouse a more or less uniform impression on a group of listeners even when the impression is incorrect. *The uniformity of opinion regarding the personality of radio speakers is somewhat in excess of the accuracy of such opinion*.

4. This discovery is evidence that stereotypes play an important part in making the judgments. In everyday life we frequently hear people say, "He talks like a poet," "He sounds like a politician," "You can tell from his voice that he is timid." Likewise, in the laboratory situation it appears that *for the various features of personality there is associated in the minds of the judges some preconception of the type of voice to which these features correspond*.

5. These preconceptions regarding the type of voice which "should" accompany various features of personality are not equally definite for each feature. The results show that *the more highly organized and deep-seated traits and dispositions are judged more CONSISTENTLY than the more specific features of physique and appearance*. In the group of characteristics which include physical features and handwriting only 33% of the matchings were "significant" (either correct or incorrect), while among the features classified as "interests and traits" almost twice as many (64%) were "significant."

6. *Not only are the more highly organized traits and dispositions judged more consistently than such outer characteristics as physique and appearance, but they are also judged more CORRECTLY.* One-third of the judgments on "physical and expressive" features were significantly positive, whereas one-half of the judgments on "traits and interests" were positive and significant. This finding should be taken as supporting a dynamic and personalistic theory of expression (2, Chap. VII). It is clear that vocal expression is not specific and independent; it is associated to some extent with other physical and expressive features, but especially with the highly organized qualities of the "inner" personality.

7. *If a voice arouses a stereotype of the speaker, it is likely that several features of personality will be subsumed under that stereotype.* Thus in Experiment VII, speaker Q was correctly judged to be the artist by 71% of the listeners (only 3% said he was the business man). But the stereotype of an artist's voice was not confined to vocation alone. Fifty-six per cent of the listeners said that he was markedly submissive, 73% thought he had a light complexion, and 44% said he was tall. All of these judgments were significantly above chance and all of them wrong. Likewise in the same experiment, speaker R was correctly judged by 72% of the listeners to be the business man. And 65% believed (correctly in this case) that the business man had a dark complexion.

There is therefore a kind of totalizing effect which is prejudicial to accurate and detailed judgment. It is an aspect of the common tendency toward undue economy and simplicity encountered in much recent work upon judgment and attitudes. In the field of personality especially it seems that impressions are often oversimplified almost to the point of caricature.

8. The matching of voice with *summary sketches* was rather more successful than the matching with any single feature. *The more information given concerning the speaker, the more accurately is his voice identified.* Whereas the totalized stereotype is often prejudicial to correct estimates, the totalized portrait is helpful. This finding constitutes an argument against "segmental" and "atomistic" research upon arbitrarily isolated variables in personality. Studies which deal with the interplay and patterning of qualities are closer to the realities of organized vital processes, and for that reason yield more positive results.



9. *The success of judgment is inevitably influenced by the heterogeneity of the voices and personalities of the speakers.* It is quite clear that if any of our groups of three speakers contained a captain of industry, a prima donna, and the village idiot, there would be almost no errors in matching. Too great a homogeneity among voices or personalities is equally prejudicial to representative results. The inconclusive findings in Experiment VI are to be explained by the lack of distinctive quality in the three voices. The striking results of certain other experiments (e. g., VII and VIII) are due to the use of contrasting types. Our eighteen speakers were of the same sex, and differed less than a random sampling of population in respect to age, educational status, and racial background. On the other hand, the use of the matching method required that the personalities be at least distinguishable by the objective tests and measurements which were employed as the criteria. All in all, it is probably true that our groups were neither unusually heterogeneous nor homogeneous, but represented reasonable variations in type.

10. It must be remembered that the criteria chosen for these experiments are all "objective," and are perfect neither in their reliability nor in their validity (excepting only records of physical characteristics). Those who are familiar with the complexities of the task of measuring personality will find it rather remarkable that the human voice can be so accurately matched with results obtained from the available tests for ascendance-submission, extroversion-introversion, and personal values. Such a degree of success with these objective criteria constitutes a peculiar kind of validation for the tests themselves and an encouragement to their further development. At the same time, since the criteria are imperfect, it must be borne in mind that the human voice may reveal even more concerning personality than our results indicate. *In our desire to keep the investigation objective and quantitative, we may have minimized the degree to which the voice expresses personal qualities.*

11. When some of the experiments were repeated, using a curtain rather than the radio to conceal the speaker, the average results were approximately 7% higher. This finding seems to indicate that *there is a slight distortion of the voice due to the background of mechanical noise.* Further improvements in broadcasting may reduce or eliminate this distortion.

12. Strong supporting evidence for certain of our conclusions was



obtained in two minor experiments (IX and X) which demonstrated that *free descriptions of personality from voice were successfully recognized by other listeners and by acquaintances of the speakers.*

### SUMMARY

Ten experiments were conducted in the Harvard Psychological Laboratory, where a complete broadcasting and receiving equipment had been installed, and from the studio of Station WEEI in Boston. Eighteen male speakers and over six hundred judges took part. The method consisted chiefly in matching objective information obtained for twelve features of personality (e. g., age, photographs, handwriting, dominance, extroversion) with the corresponding voices. In comparing these matchings with chance it was found that the majority were successful, often by large margins, but that no single feature was always matched correctly, nor was any individual speaker correctly judged in every respect. It was also found that the uniformity of opinion regarding the personalities of the speakers was somewhat in excess of the accuracy of such opinion, showing the importance of stereotypes. In general, better results were obtained from the use of summary sketches than from single features, and judgments were more often correct for the organized traits and interests of personality than for mere physical features. There is a discussion of the relation of successful matching to the heterogeneity of the voices and personalities participating in the experiments; likewise of the use of strictly objective criteria. When the speakers read from behind a curtain instead of over the radio it was found that on the average approximately 7% higher results were obtained. Additional experiments showed that free descriptions of personality sent in by judges were in general successfully recognized by other listeners and by acquaintances of the speakers.

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## L'ESTIMATION DE LA PERSONALITÉ AU MOYEN DE LA VOIX

### (Résumé)

On a fait dix expériences dans le Harvard Psychological Laboratory où l'on a installé un appareil complet d'émission et de réception radiotéléphonique, et dans la salle d'émission du poste WEEI à Boston. Dix-huit parleurs mâles et plus de six cent estimateurs y ont participé. La méthode a consisté principalement à choisir les voix qui correspondaient à des renseignements objectifs obtenus pour douze traits de personnalité (c'est-à-dire, âge, photographes, écriture, dominance, extroversion). La plupart de ces choix ont été heureux, souvent à un grand degré, mais aucun seul trait n'a été toujours choisi correctement; et on n'a estimé aucun parleur individuel correctement à tous les égards. On a constaté aussi que l'uniformité de l'opinion des personnalités des parleurs a été un peu plus grande que l'exactitude de cette opinion, ce qui montre l'importance des stéréotypes. En général on a obtenu de meilleurs résultats en employant des esquisses sommaires que de seuls traits, et les estimations ont été plus souvent justes au cas des traits organisés et des intérêts de personnalité qu'au cas des traits seulement physiques. On discute la relation entre les choix heureux et l'hétérogénéité des voix et des personnalités qui ont participé aux expériences; ainsi que l'emploi des critères strictement objectifs. Quand les parleurs ont lu derrière un rideau au lieu d'émettre la lecture à la radio, on a constaté qu'on a obtenu en moyenne des résultats plus élevés d'environ sept pour cent. D'autres expériences ont montré que des descriptions libres de personnalité soumises par les estimateurs ont été reconnues heureusement par d'autres auditeurs et par les connaissances des parleurs.

ALLPORT ET CANTRIL

## BEURTEILUNG DER PERSÖNLICHKEIT NACH DER STIMME

### (Referat)

Man führte zehn Experimente im Harvard Psychologischen Laboratorium aus, wo eine vollständige Radiogeber- und Empfangsapparatur installiert wurde; und in Verbindung mit dem Atelier der Station WEEI in Boston. Achtzehn männliche Redner und über sechshundert Richter nahmen daran Teil. Die Methode beruhte hauptsächlich in der Paarung von Informationen, die man mit Bezüge auf zwölf Persönlichkeitsmerkmale erhalten

hatte (z. B., Alter, Photographien, Handschrift, Wille zum Herrschen, Extroversion) mit den entsprechenden Stimmen. Diese Paarungen gelangen in der Mehrzahl, oft mit grossem Spielraum; aber kein einziges Merkmal wurde immer richtig gepaart; noch wurde jeder einzelne Redner in jeder Hinsicht richtig beurteilt. Man fand ferner, dass die Uebereinstimmung in der Meinung über die Persönlichkeit der Redner die Genauigkeit solcher Meinung etwas übertraf, was auf die Bedeutung der Stereotypen hinweist. Im Allgemeinen erhielt man bessere Ergebnisse beim Gebrauch von summarischen Skizzen als bei dem von einzelnen Merkmalen, und die Urteile waren häufiger korrekt für organisierte Merkmale und Interessen der Persönlichkeit als für blosse körperliche Merkmale. Die Arbeit diskutiert die Beziehung erfolgreicher Paarrung zur Ungleichartigkeit der Stimmen und Persönlichkeiten, die an den Experimenten teilnehmen; und ferner den Gebrauch objectiver Kriterien. Wenn die Redner hinter einem Vorhang statt durch den Radio sprechen, so waren die Ergebnisse um etwa sieben Prozent besser. Weitere Experimente zeigten, dass die freie Beschreibung der Persönlichkeiten, die von den Richtern eingesandt wurden, im Allgemeinen von andern Zuhörern und Bekannten der Redner erkannt wurden.

ALLPORT UND CANTRIL

## A PSYCHONEUROTIC INVENTORY OF PENITENTIARY INMATES\*<sup>1</sup>

*From the Institute for Juvenile Research, Chicago*

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RAY MARS SIMPSON

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The psychoneurotic inventory came into vogue during the World War as a device for ascertaining the fitness of individuals to adjust themselves to the stress and strain of military activity. At that time Professor R. S. Woodworth (1917) prepared a pencil-and-paper questionnaire consisting of a list of 116 questions designed to elicit responses which might indicate maladjustment in an individual. Johnson (1920), Mathews (1923), Cady (1923), Laird (1925), House (1927), L. L. and T. G. Thurstone (1929), and others have made many improvements upon the original Woodworth questionnaire.

The results secured by Cady (1923), Slawson (1925), Bridges and Bridges (1926), Cushing and Ruch (1927), and others show that, in comparison with normal children, delinquent boys and girls give a greater number of unfavorable responses to the psychoneurotic inventory. The above studies deal mainly with delinquent boys and girls while the present study deals with adult offenders.

No single test is available which will give a complete description of maladjustment in an individual. However, this should not discourage further attempts to devise ways and means for measuring personality factors. The psychiatric diagnosis is more dependable than any test yet devised since it is based upon supplementary data found in the confirmed life history of the individual in addition to knowledge gained through direct observation. Most psychiatrists, sociologists, social workers, and psychologists would agree that it is highly desirable to develop more objective methods for eliminating the subjective elements involved in individual judgments. The present form of the psychoneurotic inventory gives some conception

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of the degree to which psychologists have succeeded in attaining the above goal. In spite of evident weaknesses, nevertheless it must be admitted that it is a step in the right direction.

In this study the Thurstone "Personality Schedule" was administered to a random sample of 252 male prisoners incarcerated in the Illinois State Penitentiary at Joliet. The age of the prisoners varied from 18 to 48 years. This adjustment questionnaire was filled out by the so-called "fish gallery" within six weeks after the men had entered prison. Approximately 50 per cent of the group (125 out of 252 men) had been in prison previous to their present incarceration. The Thurstone Personality Schedule, or "Neurotic Inventory" (3), was chosen for this study because it represented a meticulous revision of all preexisting schedules of a similar nature, including those of Woodworth, House, Freyd, and Allport. This inventory, or schedule, consists of a list of 223 questions which roughly define the chief characteristics of a neurotic personality as currently described by outstanding authorities in the fields of psychiatry and psychology. The subjects were required to answer the questions by encircling "yes," "no," or "?" (the question mark indicates uncertainty). Since the validity of the schedule depends upon the honesty of the subject, it is evident that it is highly desirable to check the results against other available criteria which might be linked with neurotic tendencies or maladjustment. It is also desirable to make comparisons between groups of so-called "normal" individuals and groups of individuals which society has ostracised because of failure to adjust to established modes of conduct.

In this study, scores made by prisoners on the inventory have been thrown into contrast (1) with the scores made by a representative group of college students; (2) with the number of previous incarcerations of the prisoners; (3) with available data on venereal infections; and (4) with job turn-over. Such comparisons are, of course, based upon many not-too-well-founded assumptions. For example, it is assumed (1) that neurotic tendencies are probably accompanied by a certain amount of maladjustment; (2) that college students are probably more normal than prisoners in so far as neurotic tendencies are concerned; (3) that prisoners with past criminal records are likely to be more neurotic than first offenders; (4) that venereal infection probably is accompanied by a certain amount of mental disturbance; and (5) that excessive job turn-over is probably linked



with instability. In the absence of other available criteria in such studies of personality and conduct, it becomes necessary to seize upon any suggestive evidence which might have directive significance.

The first comparison mentioned above is shown graphically in Figure 1. In this chart the classification of 252 prisoners is thrown

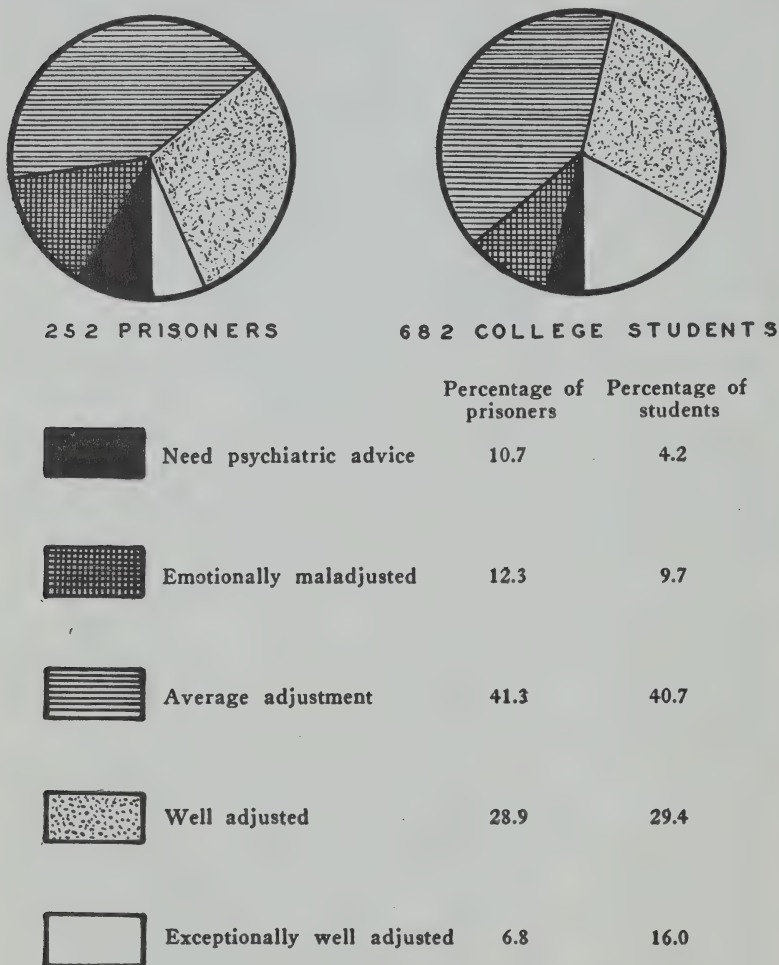


FIGURE 1

CLASSIFICATION OF 252 PRISONERS AND 682 COLLEGE STUDENTS ACCORDING TO SCORES MADE ON THE THURSTONE PERSONALITY SCHEDULE

into contrast with the classification of 682 college students made by L. L. and T. G. Thurstone at the University of Chicago in 1929. By combining the percentages of those who were found to be "emotionally maladjusted" with those who were in "need of psychiatric advice" it will be seen that 9.1 per cent more prisoners than students are rated as psychoneurotic. It should also be noted that 9.2 per cent more students than prisoners were "extremely well adjusted."

It seems reasonable to assume that prisoners are more maladjusted than college freshmen. This belief is upheld by the difference in mean scores made by the prisoners and college freshmen on the Personality Schedule. The mean score for the 252 prisoners in this study was  $44.6 \pm .96$ , while that for the 682 college freshmen in the Thurstones' original report was  $36.0 \pm .56$ . This suggests that college freshmen have fewer neurotic tendencies than penitentiary inmates. This difference seems very significant in view of the fact that the prison group was slightly older and, furthermore, that they were in a position which probably led many of them to conceal their faults to a greater extent than the college group.

The second comparison, presented compactly in Table 1, is that between the scores made by prisoners on the Personality Schedule and the number of known previous incarcerations. An individual who makes a score between 60 and 70 on the inventory is considered by the Thurstones as "emotionally maladjusted." A person who makes a score of 80 or above is considered as being in need of "psychiatric advice." In analyzing Table 1 especial attention should be paid to those who made scores of 60 or over (see lower portion of the table). An examination of Table 1 shows that 38.8 per cent (21 men) of the 54 prisoners who made scores of 60 or over had no known previous criminal record while 61.2 per cent (33 men) of the same group had been in prison before. The coefficient of mean square contingency between scores on the Personality Schedule and the number of previous incarcerations was 0.338. In short, the Thurstone Personality Schedule classifies those with past criminal records as slightly more psychoneurotic than first offenders.

In checking the records of the 252 prisoners who answered the questions in the Personality Schedule it was discovered that 43 men had had syphilis and that 61 men had had gonorrhea. This discovery led to a third type of comparison, namely, that between the scores of those who had been infected with venereal disease and the

scores of those who had not been infected. The group who had been infected with syphilis had a mean score of  $51.2 \pm 0.14$  on the inventory, while the mean score for the gonorrhea group was  $39.3 \pm 0.21$ . Since the mean score made on the Personality

TABLE 1  
SCORES OF 246 PRISONERS ON PERSONALITY SCHEDULE COMPARED WITH PAST CRIMINAL RECORD

Score on personality schedule	None	Number of previous incarcerations					Total
		1	2	3	4	5-over	
0- 9	2	1		1			4
10-19	17	5	6	1		1	30
20-29	27	13	9	3	2	2	56
30-39	23	13	7	1	5	1	50
40-49	18	6	4	2		1	31
50-59	14	3	2		1	1	21
60-69	7	2	3	3	1		16
70-79	5	6	1	2			14
80-over	9	6	6	1		2	24
Total	122	55	38	14	9	8	246

Coefficient of Mean Square Contingency = .338.

Schedule for the total group of 252 prisoners was  $44.6 \pm 0.96$ , it seems evident that the inventory serves to link neurotic tendencies with a medical history of syphilis. It is interesting to note that the group who had had experiences with gonorrhea is rated by the schedule as better adjusted than the average for the total group of 252 prisoners. Probably this reflects the common knowledge that gonorrhea is more amenable to treatment than syphilis. The score for the syphilitic group ranged from 8 to 191, while the range for the gonorrhea group was from 3 to 108. The above figures suggest that those who have had syphilis, in contrast with those who have not had syphilis, are likely to be harassed by an excessive amount of mental disturbance.

The fourth criterion of maladjustment to be used in connection with scores made on the Personality Schedule is that of the average length of time spent on jobs. Figures covering length of time spent on jobs were secured by means of an Occupational Inventory (1), prepared by the author. The inventory consists of a list of 219 basic occupations. The subject is asked to read through the list of oc-

cupations and check all those in which he has ever worked. A record is also secured of the length of time on each type of work.<sup>2</sup>

Data are in hand which show that individuals with no criminal record remain on jobs for longer periods of time than men with criminal records. If it is granted that prisoners are more maladjusted than free men it seems reasonable to believe that excessive job turn-over must be considered as partial evidence of maladjustment. Maladjustment is generally considered as one of the main symptoms of psychoneurosis.

The Pearson- $r$  coefficient of correlation between the average length of time spent on various jobs by the 251 prisoners and the scores made on the Thurstone Personality Schedule was  $-.038 \pm .042$ . This suggests that there is no relationship between the average length of time spent on jobs and neurotic tendencies as measured by the Thurstone Personality Schedule. The mean for the number of months spent on jobs was  $26.52 \pm .991$ , while the mean for scores on the Personality Schedule was  $44.52 \pm 1.013$ .

The Pearson- $r$  coefficient of correlation between age and scores on the Personality Schedule was  $0.016 \pm 0.043$ . This low correlation shows that the scores made on the Personality Schedule are not complicated by the factor of age.

Intellectual capacity seems to have very little to do with psychoneurotic tendencies. The Pearson- $r$  coefficient of correlation between scores on the Army Alpha Intelligence Examination and scores on the Thurstone Personality Schedule was  $-0.047 \pm 0.042$ . This finding confirms that of the Thurstones. They found a correlation of 0.037 between scores on the Personality Schedule and intelligence as measured by the Psychological Examination of the American Council of Education. A glance at the figures in the column covering those who "need psychiatric advice" in Table 2 shows that 18.5 per cent of the group of 27 men who had "A" intelligence were "in need of psychiatric advice," while practically the same percentage (17.8 per cent) of those with "C—" intelligence, for example, were also "in need of psychiatric advice." It should be noted that the number of cases in the various categories in Table 2 is too small to justify any valid conclusions here. Table 2 is presented mainly to show the distribution of scores on the Personality

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<sup>2</sup>For further description of this inventory see Simpson (2).

Schedule in relation to scores on the Army Alpha Intelligence Examination.

The following tentative conclusions seem justified by the foregoing facts:

1. Scores made on the Thurstone Personality Schedule indicate that penitentiary inmates are slightly more psychoneurotic than a representative sampling of college students.

2. The Thurstone Personality Schedule rates those with past criminal records as slightly more psychoneurotic than first offenders.

3. The Thurstone Personality Schedule classifies those who have had syphilis as slightly more psychoneurotic than those who have not had syphilis.

4. There is practically no relationship between psychoneurotic tendencies as established by scores on the Thurstone Personality Schedule and the average length of time spent on jobs.

TABLE 2  
SCORES OF 252 PRISONERS ON ARMY ALPHA EXAMINATION COMPARED WITH  
SCORES ON PERSONALITY SCHEDULE

Intelligence (Army Alpha rating)		Personality rating					Total
		Ex- tremely well ad- justed	Well ad- justed	Aver- age ad- justment	Emo- tional- ly mal- adjusted	Need psychi- atric advice	
A	Cases	2	9	4	7	5	27
	Per cent	7.5	33.3	14.8	25.9	18.5	100.0
B	Cases	3	15	14	2	3	37
	Per cent	8.1	40.5	37.9	5.4	8.1	100.0
C+	Cases	8	16	28	7	6	65
	Per cent	12.4	24.6	43.0	10.8	9.7	100.0
C	Cases	1	21	38	12	4	76
	Per cent	1.3	27.7	50.0	15.8	5.2	100.0
C—	Cases	3	12	19	3	8	45
	Per cent	6.7	26.6	42.3	6.6	17.8	100.0
D-E	Cases			1		1	2
	Per cent			50.0		50.0	100.0
Total	Cases	17	73	104	31	27	252
	Per cent	6.8	28.9	41.3	12.3	10.7	100.0

The Pearson-*r* coefficient of correlation between scores on Army Alpha Intelligence Examination and scores on the Thurstone Personality Schedule was  $-.0469 \pm .042$ .



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## UN INVENTAIRE PSYCHONÉVROSIQUE DES PRISONNIERS DES PENITENCIERS

(Résumé)

Dans cette étude on a administré "E'Echelle de Personnalité" de Thurstone à 252 prisonniers mâles du Penitencier de l'Etat de l'Illinois à Joliet. On a comparé les résultats à ceux trouvés par les Thurstones avec 682 étudiants universitaires. On a fait aussi diverses autres comparaisons pour établir les conclusions suivantes:

1. Les résultats de l'Echelle de Personnalité de Thurstone indiquent que les prisonniers des pénitenciers sont un peu psychonévrosiques qu'un sampling représentatif des étudiants universitaires.
2. L'Echelle de Personnalité de Thurstone montre que ceux qui ont été mis en prison plusieurs fois pour divers crimes sont un peu plus psychonévrosiques que ceux mis en prison pour la première fois.
3. L'Echelle de Personnalité de Thurstone montre que ceux qui ont souffert de la syphilis sont un peu plus psychonévrosiques que ceux qui n'ont pas souffert de la syphilis.
4. Il n'existe presque aucune relation entre les tendances psychonévrosiques établies par les résultats de l'Echelle de Personnalité de Thurstone et la durée moyenne du temps passé au travail.

SIMPSON

## EIN PSYCHONEUROTISCHES INVENTAR VON STRÄFLINGEN

(Referat)

In dieser Untersuchung wurde Thurstones "Persönlichkeitsverzeichnis" (Personality Schedule) 252 männlichen Sträflingen der Staatlichen Strafanstalt von Illinois zu Joliet vorgelegt. Die Ergebnisse wurden verglichen mit denjenigen, die die Thurstones bei 682 Collegestudenten gefunden hatten. Verschiedene andere Vergleiche wurden angestellt und ergaben die folgenden Schlussfolgerungen:

1. Angaben nach dem Thurstoneschen Persönlichkeitsverzeichnis zeigen, dass Sträflinge ein wenig psychoneurotischer sind als eine representative Auswahl von Collegestudenten.
2. Das Thurstonesche Persönlichkeitsverzeichnis zeigt, dass Sträflinge

die früher schon Verbrechen begingen ein wenig psychoneurotischer sind als erstmalige Verbrecher.

3. Das Thurstonesche Persönlichkeitsverzeichnis bezeichnet diejenigen, die syphilitisch waren als etwas psychoneurotischer als diejenigen, die nie syphilitisch waren.

4. Es besteht fast gar keine Beziehung zwischen psychoneurotischen Tendenzen, wie sie durch das Thurstonesche Persönlichkeitsverzeichnis festgestellt wurden, und der durchschnittlichen in einer Anstellung verbrachten Zeit.

SIMPSON

# THE INDUCTION OF OPINION THROUGH SUGGESTION BY MEANS OF "PLANTED CONTENT"\*1

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## INTRODUCTION

The importance of the press as an agency in the formation of public opinion has been a subject of controversy in political science round tables, journalism, and social psychology. The influence of the newspaper editorial, particularly, has been questioned by Graves (4, pp. 323-327), Lumley (5), and other writers. However, few studies concerning this problem have been reported. Bird (1) found that the distortion of lecture material by a student newspaper had a definite effect upon the accuracy of report. Lundberg (6), on the other hand, found little relation between editorial attitudes and attitudes of the reader.

In a systematic examination of the press as an agency of public opinion formation, the social psychologist can study the influence of the press experimentally by using as the stimulus medium current issues of the full newspaper into which the significant content may be "planted," and therefore controlled, without the readers' being aware of the substitution.

It is believed that the press forms opinion through the psychological mechanism of propaganda, which may be defined as the organized dissemination of biased opinion, ideas, and attitudes. Propaganda is distinguished from advertising and education in that the purpose of the propaganda is not made known to the reader. Young (8, p. 653), Strong (7), and other writers believe that propaganda develops the emotional association of words with the desires and attitudes of the reader through the technique of suggestion. Dodge (2) calls this process an "emotional transference." The process of suggestion

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<sup>1</sup>Acknowledgment is made to Professor Frank L. Mott of the School of Journalism of the University of Iowa, who suggested the use of the full newspaper as stimulus medium.

is of an unconscious character, and, in the absence of known causation, the reader attributes the suggested ideas to his own reasoning. Suggestions in the form of selected news and editorial interpretations are accepted uncritically, since the reader is seldom able to verify the accuracy of news material. According to Dunlap (3), the operation of suggestion demands persistent repetition if propaganda is to be made effective.

As an agency of propaganda the daily newspaper fulfills the conditions which propaganda requires, namely, frequent presentation of the same idea in varying forms, a short period of reading, and inability on the part of the reader to know the purposes or sources of propaganda material.

In this study a new technique was devised to determine the effect of defined propaganda stimuli presented through the newspaper editorial. The central purpose was to find the extent to which favorable and unfavorable opinion concerning a person could be built up through suggestion by means of "planted" editorials, starting from complete ignorance of the person on the part of the readers.

#### EXPERIMENTAL TECHNIQUE

In a study of individual propaganda, it was thought necessary to select a person who would be entirely unknown to the subjects at the beginning of the experiment. Mr. W. Morris Hughes, the Prime Minister of Australia from 1915 to 1923, was chosen, since there was no current publicity concerning him and since he was prominent enough in public life to carry plausibility.

In order to show whether the subjects were uninformed regarding Mr. Hughes, an Information Check Test was devised in which twenty-five names were identified, including that of the person in question. The accuracy of the identification was checked by means of a completion test in which the subjects were asked to fill out fifty completion sentences, including the names of the political leaders of ten nations, one being that of "The Prime Minister of Australia during the World War (1915-1923)," and also four important facts concerning each of the ten names. The purpose of the material not referring to Mr. Hughes was to avoid placing emphasis on the significant information.

*The "Planted Content" Technique.* A new technique was devised for studying the *modus operandi* of propaganda. This technique

made use of "planted" editorials which were substituted, without the subjects' knowledge, for editorials of the same length appearing in current issues of *The Daily Iowan*, the University of Iowa student newspaper.

The "planted" editorials were designed so as to resemble the editorials of *The Daily Iowan* in style and subject-matter. Prior to the writing of these editorials, a large number of news items and editorials were collected. From this material, topics were selected which would be likely to interest the subjects, such as co-education, aviation, and the church.

Thirty "planted" editorials were then constructed so that one-half of these were favorable and the other half unfavorable to Mr. Hughes. The editorials which appeared in the favorable series were identical in title, length, and general content with those of the unfavorable series. In all of the "planted" editorials, the editorial writer advocated ideas, opinions, and attitudes which were likely to find acceptance with the subjects, such as the belief in scientific progress. Mr. Hughes was shown to be in agreement with these ideas in the favorable series, while he opposed them in the unfavorable series.

The "planted" editorials ranged in length from 150 to 300 words. Whenever possible, these editorials appeared in the first column of the editorial page. An illustration of a pair of the "planted" editorials is given below:

#### *Favorable*

##### Complete Your Education

"No man's education is complete without a fairly comprehensive journey in the United States." This remark was made by Sir Esme Howard, retiring British Ambassador, at the Pilgrims Dinner in London. An old thought it is true, but wise. The dominant new note in the world is America. One who does not know America can hardly know the world.

This applies to our critics. Those from abroad who come to spend a week or two on our platforms to tell

#### *Unfavorable*

##### Complete Your Education

"No man's education is complete without a fairly comprehensive journey in the United States." This remark was made by Sir Esme Howard, retiring British Ambassador, at the Pilgrims Dinner in London. An old thought it is true, but wise. The dominant new note in the world is America. One who does not know America can hardly know the world.

This applies to our critics. Those from abroad who come to spend a week or two on our platforms to tell



us what is the matter with America should first of all know America.

Many problems which confront the Middle West or the Pacific Coast are not those which the large Eastern cities have to face. Any foreign critic who hurriedly visits only a few Eastern cities is in no position to criticize the United States as a nation.

Conspicuous among the critics from abroad is Mr. W. Morris Hughes, the former Prime Minister of Australia. In his recent lecture tour, W. Morris Hughes has demonstrated a rare appreciation and respect for our country. Mr. Hughes had previously spent many valuable months of travel and study in every part of the United States.

Future critics from abroad who examine American institutions should follow the notable example set by W. Morris Hughes, and first obtain an all-embracing familiarity with the United States.

The entire series of "planted" editorials was presented so that repeated reference to the propaganda object would appear logical to the subjects. Mr. Hughes was introduced, first, with reference to Australian politics (one editorial), second, as a foreign critic visiting America (eleven editorials), and, finally, as an Australian, friendly or unfriendly to American customs (three editorials).

It may be observed that through a "planted content" technique propaganda is studied experimentally without materially distorting the social situation. This technique enables the experimenter to control the amount, duration, periodicity, and kind of stimulus and to present the stimulus material through a natural propaganda medium.

*The Opinion Tests.* The extent to which an opinion had been formed and whether the opinion was favorable or unfavorable to Mr. Hughes was determined by means of an Editorial Opinion Test which consisted of thirty short statements summarizing each of the

us what is wrong with America should first of all know America.

Conspicuous among the most recent foreign critics of America is Mr. W. Morris Hughes, Ex-Prime Minister of Australia. W. Morris Hughes has spent a few weeks on our shores to tell us what is the matter with America. And he succeeded in telling us what is the matter with Mr. Hughes.

We humbly listen to the opinions and admonitions of self-appointed judges who are profoundly ignorant of our country. And the sad part about it is that we actually encourage foreigners such as Mr. Hughes in their propagation of international ill-will and suspicion.

Mr. W. Morris Hughes is no exception to the obvious fact that an all-embracing familiarity with the United States is needed by all those who would criticize American institutions.

thirty editorial beliefs or attitudes advocated by the writer. The statements representing the favorable editorials were similar to those of the unfavorable series, since the stimulus situations of the two series were identical. The variable factor was the favorable or unfavorable attitude of Mr. Hughes towards the editorial attitudes. The subjects were asked, therefore, to judge from their knowledge of Mr. Hughes, whether he would or would not have the beliefs or attitudes summarized in the statements, of which the following are examples:

Y y ? n N 1. Have a genuine friendship for the U.S.

Y y ? n N 13. Favor the church as a great benefit to society.

If the subjects were *certain* that Mr. Hughes would "have a genuine friendship for the U.S." a circle was drawn around the symbol "Y," or if the subject believed that Mr. Hughes *probably* would have such an attitude a circle was drawn around the symbol "y." In case the subject was *very uncertain* the symbol "?" was encircled. Likewise, the symbols "n" or "N" indicated that Mr. Hughes would not "have a genuine friendship for the U.S." At the end of this test the subjects were asked to name the nationality and best-known occupation of Mr. Hughes as this information was not given in the directions.

In order to test the assumption that the ideas advocated by the editorial writer were accepted by the subjects, a Personal Opinion Test was devised, in which the subjects were requested to express their *personal* opinions on fifteen statements identical with those which appeared in the Editorial Opinion Test, such as the following:

Y y ? n N 1. Is the church a benefit to society?

Y y ? n N 11. Is the whipping post the best cure for crime?

### THE PROCEDURE

Two hundred three students of both sexes, from three elementary psychology sections, served as subjects. The students were, for the most part, sophomores in the liberal arts college.

These conference sections met on Tuesday and Thursday of each week for a two-hour period, at eight, ten, and one o'clock. Every student had been assigned to a study table, which he occupied throughout the semester. All sections met in the same room at different two-hour periods.

In the ten-o'clock group (Section I) 75 subjects read 15 "planted" editorials, while in the one-o'clock group (Section II) 63 subjects read only the last 7 editorials in the series. Sixty-five students in the eight-o'clock group (Section III) served as a special experimental and control section. These subjects did not read the issues of *The Daily Iowan* containing "planted" content.

The Information Check Test was given to all sections nine days before the reading of the first "planted" editorial. This interval was believed sufficient to prevent attention's being called to Mr. Hughes in connection with the study. It was explained that this test was given for the purpose of studying newspaper-reading habits. The results show that Mr. Hughes was entirely unknown to the subjects prior to the presentation of the stimulus material.

The subjects in Sections I and II were divided so that those in the front half of the room read "planted" editorials favorable to Mr. Hughes and those in the rear half read the unfavorable editorials. These two groups were selected according to chance since the subjects were seated in alphabetical order.

After current editions of *The Daily Iowan*, containing the "planted" editorials, had been distributed, the subjects were given the following instructions:

The Psychology Department, in cooperation with the School of Journalism, is carrying on an investigation in the Psychology of Reading. This investigation will be valuable to you in the study of Social Psychology next semester when the results will be made known. Every Tuesday and Thursday a copy of *The Daily Iowan* will be found on your table. Please follow these instructions:

You will have sufficient time to read only the editorials, and to read them over once. Do not hurry. This is not a speed or memory test. Read the editorials as you would ordinarily read them. Please do not read the editorials again outside of this class. We want information on *normal, once-over* reading.

The subjects were allowed from five to seven minutes, at the end of the first class hour, to read all of the editorials on the page. The adequacy of this time limit had been checked by recording the time required to read all of *The Daily Iowan* editorials at the observer's normal rate of reading.

The complete series of "planted" editorials was presented during

a period of two and one-half months, beginning October 30, 1930, and ending January 15, 1931. The editorials were read twice a week, except for occasional interruptions owing to examinations and holidays.

The Editorial Opinion Test was administered to all sections five days after the reading of the last "planted" editorial. The subjects were instructed to work through the schedule with care, as the experiment had a bearing on their study of social psychology during the ensuing semester. This test was given to the control section in order to show whether those who had not read the "planted" editorials would be able to identify Mr. Hughes, thus testing the belief that the subjects would not gain biased information about him from sources other than the "planted" content.

The Personal Opinion Test was given to all sections two days following the administration of the Editorial Opinion Test. This schedule was distributed in a manner similar to the other opinion test, and the subjects were given no additional instructions.

Four months after the Editorial Opinion Test was first presented this test was again given to the experimental sections in order to determine whether these subjects would retain the induced opinion over a considerable length of time without reading further "planted" material.

In a separate experiment, the Editorial Opinion Test was again presented to the control section. Immediately before the test was filled out the experimenter correctly identified Mr. Hughes. This was done for the purpose of discovering whether the subjects would be biased for or against Mr. Hughes, knowing of his former position and judging entirely on the basis of this information.

The response to each question on the Editorial and Personal Opinion Tests was given a numerical score in order to obtain a quantitative evaluation of the extent and direction of the opinion formed. A score of plus two was given if the subject was *certain* that Mr. Hughes would be likely to have the attitude or opinion expressed in the statement; a score of plus one signified *probable* agreement, and a zero score indicated that the subject was *very uncertain*. Similar negative scores were given if the subject believed that Mr. Hughes would *not* have the accepted idea presented in these statements. Since there were thirty statements in the Editorial Opinion Test the possible range in score was from +60 to—60. Thus, the

extent to which the subject was favorable or unfavorable to Mr. Hughes was shown by the size of the positive or negative score for the entire test. The scores of subjects absent from the experiment more than once in Section II (seven editorials) and more than twice in Section I (fifteen editorials) were eliminated from the study.

## THE RESULTS

TABLE 1  
THE EDITORIAL OPINION TEST SCORES  
Mean scores and standard deviations for the favorable and unfavorable groups in Sections I and II

Section	Number cases	Group	Mean score	P.E. <sub>av.</sub>	S.D.	P.E. <sub>s.d.</sub>
I	37	Favorable	30.22	$\pm 1.22$	11.00	$\pm .86$
I	38	Unfavorable	-26.42	$\pm 1.84$	16.85	$\pm 1.30$
II	30	Favorable	30.90	$\pm 1.49$	12.06	$\pm 1.05$
II	33	Unfavorable	-20.36	$\pm 2.35$	20.05	$\pm 1.66$

Table 2 gives a comparison of the results from the favorable and unfavorable groups in both sections. This table shows that the obtained differences in the mean scores of these groups are highly significant since the ratio between the difference and the  $P.E._{diff.}$  is in each case much greater than 4. It is apparently safe to assume, therefore, that the subjects reading the favorable editorials became favorably biased towards W. Morris Hughes and those reading the unfavorable editorials became biased unfavorably.

Table 3 gives a comparison of the results from Section I (fifteen editorials) and Section II (seven editorials). The obtained mean score differences for these groups are probably unreliable since the ratio is less than 4 in both cases, although there may be a true difference in the unfavorable groups.

Figures 1 and 2 present graphically the differences between the frequency distribution of scores of the favorable and unfavorable groups in Sections I and II. It will be seen that several subjects in the unfavorable groups were favorably biased. These subjects were unable to identify Mr. Hughes accurately.



TABLE 2  
GROUP DIFFERENCES IN MEAN SCORES AND STANDARD DEVIATIONS WITH THE PROBABLE ERRORS  
OF THE DIFFERENCES

Section and group comparison	Mean diff. in scores	P.E. <sub>diff.</sub>	Diff. P.E. <sub>diff.</sub>	S.D. <sub>diff.</sub>	P.E. <sub>s.d.(diff.)</sub>	Diff. P.E. <sub>s.d.(diff.)</sub>
(I) Favorable-						
(I) Unfavorable	56.64	2.21	25.61	5.85	1.56	3.75
(II) Favorable-						
(II) Unfavorable	51.26	2.78	18.42	7.99	1.96	4.08

TABLE 3  
SECTION DIFFERENCES IN MEAN SCORES AND STANDARD DEVIATIONS WITH THE PROBABLE ERRORS  
OF THE DIFFERENCES

Section and group comparison	Mean diff. in scores	P.E. <sub>diff.</sub>	Diff. P.E. <sub>diff.</sub>	S.D. <sub>diff.</sub>	P.E. <sub>s.d.(diff.)</sub>	Diff. P.E. <sub>s.d.(diff.)</sub>
(I) Favorable-						
(II) Favorable	.68	1.93	.36	1.06	1.36	.78
(I) Unfavorable-						
(II) Unfavorable	6.08	2.98	2.05	3.20	2.11	1.52

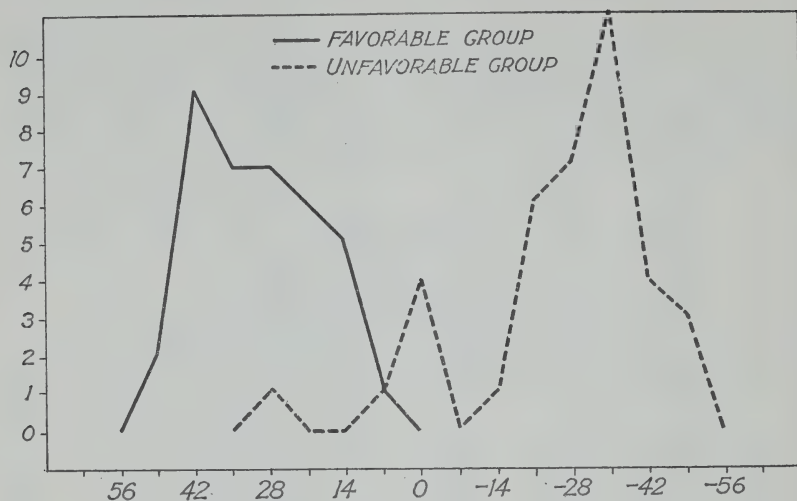


FIGURE 1

SCORES ON THE EDITORIAL OPINION TEST—FIFTEEN-EDITORIAL SECTION

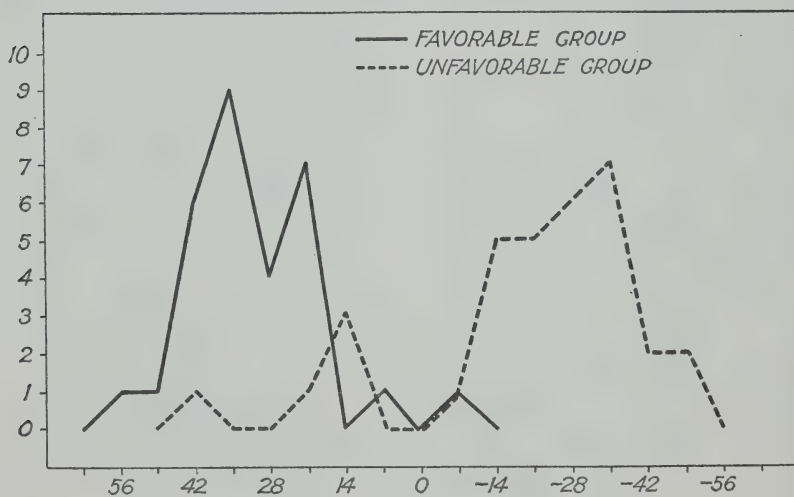


FIGURE 2

SCORES ON THE EDITORIAL OPINION TEST—SEVEN-EDITORIAL SECTION

TABLE 4  
SEX DIFFERENCES IN MEAN SCORES AND STANDARD DEVIATIONS WITH THE PROBABLE ERRORS OF THE  
DIFFERENCES FOR THE FAVORABLE AND UNFAVORABLE GROUPS\*

Groups	Sex	No. of cases	Mean score	P.E. <sub>av.</sub>	S.D.	P.E. <sub>diff.</sub>	Diff. P.E. <sub>diff.</sub>
Favorable	Male	28	27.96	±1.54	12.09	1.93	2.27
Favorable	Female	39	32.35	±1.16	10.72		
Unfavorable	Male	26	-26.96	±1.62	12.28	2.67	1.99
Unfavorable	Female	45	-21.66	±2.13	21.22		

\*Sections I and II were combined in order to insure a sufficient number of males for grouping.

The sex differences in the scores from the favorable and unfavorable groups are shown in Table 4. The ratios given in the table indicate that these differences are probably unreliable.

TABLE 5  
COMPARISON OF PERSONAL OPINION TEST MEAN SCORES AND STANDARD DEVIATIONS WITH THE P.E.<sub>diff.</sub> FOR SECTIONS I, II, AND III

Section	No. of cases	Mean scores	P.E. <sub>av.</sub>	S.D.	P.E. <sub>diff.</sub>	Diff.
						P.E. <sub>diff.</sub>
I	75	19.45	±.41	5.26		
II	63	17.44	±.45	5.33	.609	3.30
III	65	15.56	±.43	5.14	.622	3.03
					.594 [I, III]	6.55

Table 5 presents the results of the Personal Opinion Test scores obtained from Sections I, II, and III. The mean score difference between experimental Section I and control Section III is completely reliable as shown by the ratio 6.55, and there is a high degree of probability that the mean score difference between the control section and Section II (seven editorials) is a true difference as indicated by the ratio 3.03. The "planted content" appears, then, to have influenced the personal opinions of the subjects. It will be observed, however, that the mean scores of the three sections are relatively uniform in size and also positive, which apparently means that there was a tendency for the subjects in both the experimental and control groups to accept the ideas and attitudes advocated by the editorial writer.

The Editorial Opinion Test and the Personal Opinion Test scores for each subject were correlated in all groups using the Pearson product-moment formula. The purpose of the correlations was to find the degree of relationship between the tests with respect to certainty of opinion (i.e., size of the score). Consequently, the negative direction of the opinion formed in the unfavorable groups may be disregarded.

Table 6 gives a comparison of the Editorial Opinion Test scores, as shown in Table 1, and the scores of the same test given four months later. These results show that there are no significant differences in the two sets of scores except for the favorable group in Section I.

TABLE 6  
COMPARISON OF THE EDITORIAL OPINION TEST AND RETEST MEAN SCORES FOR THE FAVORABLE AND UNFAVORABLE GROUPS IN SECTIONS I AND II

Section	No. of cases	Group	Mean score 1st test	Mean score retest	Diff.	
					P.E. <sub>diff.</sub>	P.E. <sub>diff.</sub>
I	23	Favorable	30.08	18.48	2.58	4.50
I	24	Unfavorable	—27.79	—23.96	3.17	—1.21
II	24	Favorable	32.33	31.38	2.21	.43
II	26	Unfavorable	—20.58	—17.23	3.52	— .95



TABLE 7  
THE MEAN SCORE AND STANDARD DEVIATION FROM RETEST OF SECTION III

Section	No. of cases	Mean score	P.E. <sub>av.</sub>	S.D.
III	60	13.05	1.18	13.55

Table 7 gives the mean score obtained from the retesting of the control section in which Mr. Hughes had been identified before the Editorial Opinion Test was presented. This table shows that the mean score tends to be favorable to Mr. Hughes. Apparently there is a general tendency to accept a person of statesmanship rank through the prestige of position.

1. In Section I (fifteen editorials) the correlation for the favorable group was  $.267 \pm .103$ , and for the unfavorable group  $.333 \pm .097$ .

2. In Section II (seven editorials) the correlation for the favorable group was  $.561 \pm .084$ , and for the unfavorable group  $.425 \pm .096$ .

It appears from these correlations that an important factor in determining the certainty with which the subjects formed an opinion of Mr. Hughes was the certainty with which they accepted the beliefs or attitudes supported by the writer.

### SUMMARY AND CONCLUSIONS

*Summary.* A new technique for studying the *modus operandi* of individual propaganda was devised in which a newspaper reading situation provided the experimental setting. This technique made use of current issues of a newspaper in which the content was identical with the regular edition except for one "planted" editorial. The purpose of this study was to find to what extent favorable or unfavorable opinion might be built up through "planted" editorials starting from absolute ignorance of the person on the part of the subjects. Seventy-five subjects were given approximately six minutes to read all of the editorials in the newspaper twice weekly for fifteen issues, while a similar group of 63 subjects read the editorials in the last seven issues of the series. Previous to the running of the editorial series a test was given to show whether the person in question was unknown to the subjects. At the end of three months a test was given to determine the extent to which an opinion had been formed and whether adverse or favorable.

### Conclusions

1. Ninety-eight per cent of the subjects reading the favorable editorials became favorably biased towards the person selected as the propaganda object and 86% of the subjects reading the unfavorable editorials became adversely biased.

2. A highly reliable difference was found in the mean scores of the favorable group ( $30.22 \pm 1.22$ ) and the unfavorable group ( $-26.43 \pm 1.84$ ) for subjects reading the entire series of fifteen "planted" editorials.

3. A highly significant difference was found also in the mean scores of the favorable group ( $30.90 \pm 1.49$ ) and the unfavorable group ( $-20.36 \pm 2.35$ ) for subjects reading the last seven "planted" editorials in the series.

4. No definitely reliable mean score differences were found between the groups reading fifteen "planted" editorials and those reading the last seven of these editorials.

5. The mean scores representing the subject's opinion of the person in question immediately after reading the "planted" editorials were not significantly different from the mean scores on the same test given four months later, except for the favorable group in the fifteen-editorial section.

6. No reliable sex differences were found.

As a general conclusion it may be observed that opinion can be induced by means of judiciously selected suggestions in as short a time as seven issues of a newspaper, even when the person, institution, or question may be quite unknown at the inception of the series. It is believed that conditions in the daily newspaper are not much different provided people read the particular sections containing the suggestions. It would follow that, theoretically at least, any newspaper has within it possibilities to build up either favorable or unfavorable opinions by the method followed in this study.

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# L'INDUCTION DE L'OPINION AU MOYEN DE LA SUGGESTION SOCIALE PAR L'EMPLOI D'ARTICLES SPÉCIAUX DE PROPAGANDE

(Résumé)

On a fait une nouvelle technique pour étudier expérimentalement le modus operandi de propagande, en employant le journal. Les sujets ont lu deux fois par semaine la rubrique des articles de fond d'un journal où l'on avait mis un article de fond spécial à la place d'un article de même longueur paraissant dans l'édition ordinaire. Ces articles spéciaux ont décrit un individu qui, au commencement de l'expérience, a été absolument inconnu aux sujets. Les articles ont été d'ailleurs écrits en deux formes, l'une faite dans le but d'établir avec le temps par l'emploi de la suggestion subtile une opinion favorable de l'individu en question; l'autre série, dans le but de créer une opinion défavorable. Cent sujets ont lu les articles en quinze exemplaires et un groupe semblable ont lu les articles en sept exemplaires. On avait préalablement administré un test de renseignements où une liste de vingt-cinq personnes ont été identifiées, y compris la personne en question. Une seconde partie de ce test a obtenu des renseignements pour régler la fausse identification et l'action de deviner. Après trois mois on a administré un second test pour déterminer le degré auquel une opinion avait été formée et si celle-ci était défavorable ou favorable.

Quatre-vingt-huit pour cent des sujets qui ont lu les articles favorables ont eu une opinion favorable de la personne en question, et 86% des sujets qui ont lu les articles défavorables ont eu une opinion défavorable de cette personne. On a trouvé des différences élevées de constance dans les résultats moyens des deux groupes.

ANNIS ET MEIER

# DIE EINFÜHRUNG VON MEINUNGEN DURCH SOZIALE SUGGESTION IN DER FORM VON "GESTECKTEM INHALT" ("PLANTED CONTENT")

(Referat)

Man arbeitete eine neue Technik aus zum experimentellen Studium des modus operandi der Propaganda, die auf dem Gebrauch der Zeitung beruht. Die Versuchspersonen lasen zweimal wöchentlich die Redaktionsseite einer Zeitung, worin ein "gesteckter" Leitartikel einen ungafähr

gleichlangen in der regulären Ausgabe ersetzte. Diese "gesteckten" Leitartikel waren über ein Individuum, das den Versuchspersonen am Anfang des Experiments völlig unbekannt war. Die Leitartikel wurden ferner in zwei Formen geschrieben, eine, die bestimmt war, durch feine Suggestionen im Laufe der Zeit eine günstige Meinung des betreffenden Individuums zu schaffen; und die andere Serie, die eine gegenteilige Meinung hervorrufen sollte. Hundert Versuchspersonen lasen die Leitartikel in fünfzehn Ausgaben, und eine ähnliche Gruppe las die Leitartikel in sieben Ausgaben. Vorher gab man den Versuchspersonen einen Test um ihre Kenntnisse zu ermitteln; die Testaufgabe bestand darin, dass eine Liste von fünfundzwanzig Personen identifiziert werden musste, eine der Personen war die in Frage kommende Person. Ein zweiter Teil dieses Tests ermittelte Informationen zum Zwecke falsche Identifikationen und Erraten zu vermindern (check). Nach drei Monaten wurde ein zweiter Test dargeboten, um zu bestimmen, bis zu welchem Grade eine Meinung gebildet wurde und ob sie nachteilig oder günstig war.

Achtundneunzig Prozent der Versuchspersonen, die günstige gesteckte Leitartikel gelesen hatten, bildeten günstige Vorurteile über die in Frage kommenden Personen, und 86% der Versuchspersonen, die nachteilige gesteckte Leitartikel lasen bildeten nachteilige Vorurteile. Man fand hohe Zuverlässigkeitsunterschiede in Durchschnittsangaben (mean scores) beider Gruppen.

ANNIS UND MEIER

# AN ANALYSIS OF THE PERCEPTION OF INTELLIGENCE IN THE FACE\*

*From the Psychological Laboratory of Western Reserve University*

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HERBERT GURNEE

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## PROBLEM

The belief that the human face possesses some property which is a true indicator of level of intelligence has been invalidated by the results of several studies. Pintner (4), L. D. Anderson (1), Laird and Remmers (3), among others, have published data showing that rankings of photographs correlate practically zero with rankings based on intelligence test scores. Gaskill, Fenton, and Porter (2), presenting two full-length views of each of twelve boys to 274 subjects, obtained a more positive value of  $+0.42$  between test and assigned ranks.

The purpose of the present study was really twofold. First, we were interested in checking the results obtained in previous studies, for it is to be regretted that in some instances photographic conditions and such secondary criteria as age, dress, pose, etc., were not adequately controlled. But more particularly our interest was in an analysis of the perception itself. The face is a complex made up of many features. Is any one of these features more important than another in determining judgments of intelligence? Are the eyes supreme, as popular reference leads one to suppose? Are judgments based on one feature more valid than judgments based on another? Can a person have "intelligent eyes" but a "dull forehead" or a "stupid mouth"? Or is facial intelligence a wholeness property and not determined by any particular part? Such questions are the more engaging in view of the interest Gestalt psychology is reviving in the relationship between wholes and parts in perceptual experience.

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\*Accepted for publication by Carl Murchison of the Editorial Board and received in the Editorial Office, February 20, 1933.



## MATERIALS AND PROCEDURE

Eight boys, 12 to 13 years of age, were selected from the records of a large junior high school on the basis of IQ's (actually IQ equivalents) on a group intelligence test, in order to give a range by fairly equal steps from very unintelligent to very intelligent. To guard against a sampling error the boys were not seen till after selection, although teachers were consulted to make sure that none had any facial blemish, such as scars, strabismus, etc., or had a visual defect requiring glasses. Such factors are frequently neglected in this sort of study. Extremes of intelligence were purposely avoided because they are not frequent enough in the general population to afford the average person appreciable training in perceiving them; and eight boys seemed preferable to a larger number because the larger the number the smaller the IQ separation, and separations less than 10 points were not felt to be sufficiently reliable.

The boys were given the Stanford-Binet by a trained tester from the staff of the Cleveland Board of Education. The IQ's thus obtained were generally lower than the IQ's from the group test, and the intervals between IQ's were more or less affected; the rank order however remained the same. In one case the interval was reduced to two points, substantiating our belief that few cases of wide IQ separations are more desirable than many cases of smaller separations.

The test results are given in Table 1.

TABLE 1

	IQ Group test	IQ Stanford-Binet
A	92	74
B	69	72
C	148	130
D	105	90
E	117	105
F	130	112
G	50	62
H	136	122

Photographs were then made, under constant photographic conditions, by a professional photographer. The negatives were untouched except that everything below the neck was blocked out. The prints were lettered on the back in random order, A to H.

In the first part of the study, the photographs were presented to 100 male college students individually with the following instructions:

These boys vary in intelligence from very dull to very bright. Observe them carefully and then arrange the photographs in such a way that the first one is the one that appears the most intelligent to you, the second one is the one that appears next most intelligent, etc., until the last one is in your opinion the least intelligent of the group. Then record your judgments in order, from first to last, on the mimeographed sheet, using the letters on the backs of the photographs.

A brief account of the basis of judgment was also requested. The judgments of each subject were correlated with IQ's by the rank-difference method.

In the second part of the experiment each photograph was carefully divided into eyes, forehead, mouth and chin. The section of face across the lower part of the nose was left out. These three divisions were presented separately to 79 male college students, comprising an entirely different group of individuals from the preceding group. The instructions were similar except for reference to eyes, foreheads, mouths and chins. The ranking for each feature was completed before the next was presented and the presentations were in random order. S's were not allowed to look at the letters on the back till after each ranking was finished. Verbal reports were requested. The recorded ranks were correlated with the IQ's by the rank-difference method.

Votes, that is, the number of times each photograph was accorded each of the eight ranks, were counted and tabulated.

Figure 1 shows the facial parts. The order from top to bottom is alphabetical, A to H, for all three parts. The highest IQ, C, is third from the top, the lowest IQ, G, is seventh.

## RESULTS

Table 2 gives the distribution of coefficients of correlation. The validity of the judgments is, on the whole, practically zero. The superiority of the face over the facial parts is too slight to have any significance. If we were to conclude from these data, we would have to say that the distribution is hardly better than that expected by chance. That this is not altogether the case is evident from an



FIGURE 1

TABLE 2  
DISTRIBUTION OF COEFFICIENTS OF CORRELATION BETWEEN IQ'S AND  
ASSIGNED RANKS

<i>r</i>	Face	Eyes	Forehead	Mouth
.90 to .99	0	0	0	0
.80 to .89	0	0	0	0
.70 to .79	2	0	0	2
.60 to .69	4	2	0	0
.50 to .59	3	0	4	1
.40 to .49	5	2	2	3
.30 to .39	10	6	7	4
.20 to .29	14	8	10	9
.10 to .19	13	18	11	8
.00 to .09	10	10	14	7
-.10 to -.01	7	6	11	7
-.20 to -.11	12	11	8	10
-.30 to -.21	8	6	2	9
-.40 to -.31	8	5	6	6
-.50 to -.41	2	3	1	6
-.60 to -.51	1	1	2	6
-.70 to -.61	1	0	1	0
-.80 to -.71	0	1	0	1
-.90 to -.81	0	0	0	0
Total	100	79	79	79
Median	.11	.06	.06	-.08

inspection of Table 3, which contains the distribution of votes. The table indicates relationships which are wholly lost in the coefficients of correlation. One may indeed raise the question whether methods of correlation do not obscure more than they reveal.

Several facts are to be found in Table 3. It is clear that the S's show considerable agreement on first and last places. This is true of all four situations, although in two instances, last place for the face and first place for the eyes, the position is divided between two candidates. Agreement is greatest on first position for the face and last positions for the eyes, the forehead, and the mouth. Approaching the middle positions we tend to find less concord, yet even here the votes are not as a rule uniformly scattered. Difficulty in deciding middle positions was evident in behavior and in verbal reports. Gestalt theory might explain this fact in terms of the relatively greater clarity of boundaries as compared to middles in mental configurations.

It is further obvious from Table 3 that a person may possess

TABLE 3  
DISTRIBUTION OF VOTES

Assigned ranks		1	2	3	Rank of	5	6	7	8	
		C	H	F	4	D	A	B	G	
Face	1	21	9	4	6	48	6	4	2	100
	2	26	3	17	7	20	7	13	7	
	3	16	4	14	12	15	10	15	14	
	4	17	9	13	15	4	7	16	19	
	5	8	8	18	19	4	11	15	17	
	6	8	12	19	9	6	16	16	14	
	7	3	22	11	14	2	16	13	19	
	8	1	33	4	18	1	27	8	8	
Eyes	1	24	0	13	1	24	5	8	4	79
	2	12	2	19	2	32	1	6	5	
	3	15	1	18	1	15	12	7	10	
	4	13	3	11	3	5	11	13	20	
	5	7	7	7	10	0	19	17	12	
	6	5	2	4	25	3	14	16	10	
	7	3	14	7	27	0	5	9	14	
	8	0	51	1	9	0	13	2	3	
Forehead	1	10	5	13	0	23	3	18	7	79
	2	14	14	17	1	7	3	14	9	
	3	15	8	11	1	11	7	15	11	
	4	11	13	8	2	10	7	16	12	
	5	13	13	13	0	9	12	5	14	
	6	12	12	12	4	12	12	5	10	
	7	5	11	3	14	6	24	5	11	
	8	0	3	2	57	1	10	1	5	
Mouth	1	5	0	12	28	13	3	1	17	79
	2	12	0	10	21	20	4	2	10	
	3	21	0	5	15	18	5	5	10	
	4	13	2	14	7	11	11	7	14	
	5	14	7	15	6	7	9	11	10	
	6	6	7	12	1	5	17	18	13	
	7	8	11	10	1	5	17	24	3	
	8	0	52	1	0	0	13	11	2	

stupidity in one feature but intelligence in another. E, for example, has a most intelligent-looking mouth but a stupid forehead and stupid eyes, while B has a very inferior mouth but a superior forehead. C has superior eyes but a rather mediocre forehead.

The judgment on the face as a whole appears to be not a consequence of an isolated part but a balance of all the parts in relation. Thus B's superior forehead is counteracted by an inferior mouth to give him a mediocre face, and E's distinctly superior mouth is



counteracted by a distinctly inferior forehead and quite inferior eyes to give him a less than average face. On the other hand, summation may occur. D's distinctly superior eyes and forehead and quite superior mouth summate to give him uncontested possession of first place, while A's generally less than average facial parts summate to give him nearly a tie with H for last place. H's most inferior eyes and mouth are not sufficiently counteracted by an average forehead to lift him out of last place, although his votes are considerably reduced.

It is probably evident that if a particular judgment were based on only a single feature, the votes on the face as a whole ought to be divided between the disparate positions attained on the facial parts and not spread out somewhere between. That is to say, E, for example, with his distinctly superior mouth, ought to get more than six first places for the entire face.

The objective data generally contradict the verbal reports on the rankings of the face as a whole. Approximately three-fourths of the 100 S's gave a single feature as the basis of judgment, though often the remarks were qualified by hesitancy or a statement of uncertainty. Forty-five per cent gave the eyes, 14% the mouth and lips, 7% the forehead, 3% the shape of the head, 2% the chin, 26% the general expression, and only 3% said they did not know. This emphasis upon the eyes is apparently a popular delusion, because there is no more correlation between the judgments on the face as a whole and the judgments on the eyes than there is between the judgments on the face as a whole and the judgments on either of the other two parts. One is forced to conclude that verbal reports in such instances are highly untrustworthy.

The verbal reports on the rankings of the facial parts are of some interest: 41% of the S's reported the eyes the easiest to judge; 31% gave the forehead, and 28% the mouth. Yet Table 2 shows the eye judgments to be no more valid than the others.

The criteria given possessed considerable uniformity. With regard to the eyes, approximately three-fourths of the S's used terms which indicated that the tonus of the lid was the deciding factor. For example, D's eyes show intelligence because they are "wide-awake," "wide-open," "alert," "do not droop." At the same time the lid can evidently be too wide-open; A's eyes are "too stary," "too pop-eyed," to show high intelligence. Turning to the mouth,

we find tonus again implied; "determination" and "firmness" are mentioned eight times out of ten in connection with S's choice. With regard to the forehead, on the other hand, the criteria were invariably anatomical. Height of forehead was most frequent, with now and then width and shape also mentioned.

### SUMMARY

1. Facial photographs of eight boys, ranging in IQ from 62 to 130 were presented to 179 subjects.
2. Correlations between IQ ranks and assigned ranks for the face as a whole, and for eyes, foreheads, and mouths separately, were practically zero.
3. Facial features do not necessarily correlate with each other with respect to apparent intelligence. The intelligence value of the face is dependent upon all the parts in relation rather than upon any single part.
4. One feature may balance another feature in determining the value of the whole face.
5. Good or bad features may summate to raise or lower the value of the whole face.
6. Apparent degree of tonus is the most frequently reported criteria of intelligence in eyes and mouth; anatomical characteristics predominate for the forehead.

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## UNE ANALYSE DE LA PERCEPTION DE L'INTELLIGENCE DANS LA FIGURE

(Résumé)

Des photographies faciales de 8 garçons, âgés de 12 à 13 ans, et variant en Q.I. de 62 à 130, ont été présentées à 100 personnes, pour qu'elles les mettent en ordre selon l'intelligence apparente. La corrélation médiane entre les rangs assignés et les Q.I. a été de  $+0,11$ . On a ensuite divisé les photographies en trois parties, les yeux, le front, et la bouche, et chaque partie a été mise en ordre de rang par un autre groupe de 79 personnes. Les corrélations médianes ont été encore d'environ nulles. Les résultats montrent que les parties faciales ne montrent pas toujours une corrélation à l'égard de l'intelligence apparente; on peut avoir une bouche "stupide" et un front "intelligent," etc. La valeur d'intelligence de la figure dépend de toutes les parties dans leur rapport plutôt qu'une seule partie. Les traits pareils peuvent faire une sommation, les traits non pareils peuvent faire un équilibre, pour déterminer la valeur de la figure comme ensemble. Le tonus apparent est le critère ordinaire de l'intelligence pour les yeux et la bouche, les traits anatomiques pour le front.

GURNEE

## EINE ANALYSE DER INTELLIGENZWAHRNEHMUNG NACH DEM GESICHT

(Referat)

Gesichtsphotographien von 8 Knaben, die 12 bis 13 Jahre alt waren und im IQ von 62 bis 130 variierten, wurden 100 Personen vorgelegt mit dem Ersuchen, ihren Rang nach scheinbarer Intelligenz zu ermitteln. Die mittlere (median) Korrelation zwischen zugeteiltem Rang und IQ war  $+0,11$ . Die Photographien wurden dann in drei Teile geteilt, Augen, Stirne und Mund, und jeder Teil wurde durch eine andere Gruppe von 79 Personen beurteilt. Die mittleren Korrelationen waren wieder ungefähr Null. Die Ergebnisse zeigen, dass Gesichtsteile mit Bezug auf scheinbare Intelligenz nicht korrelieren mögen; man kann einen "dummen" Mund und eine "intelligente" Stirne u. a. haben. Der Intelligenzwert des Gesichts hängt eher von den Teilen im Zusammenhang als von irgend einem einzelnen Teile ab. Gleiche Züge können sich summieren, ungleiche ausgleichen in der Wertbestimmung des ganzen Gesichts. Scheinbare Spannkraft ist das gewöhnliche Kriterium des Intelligenz für Augen und Mund, anatomische Merkmale für die Stirne.

GURNEE

# SHORT ARTICLES AND NOTES

## NORMS FOR THE CLARK-THURSTONE INVENTORY

RAYMOND ROYCE WILLOUGHBY

The derivation of the Clark-Thurstone Inventory, a revision and abridgment of the well-known Thurstone Personality Schedule or Neurotic Inventory, has been reported in full in a preceding article (5). Since several hundred completed forms have now been received and scored,<sup>1</sup> a description of the statistical behavior of the instrument may be offered.<sup>2</sup>

### RELIABILITY

A mixed population of 267 cases yields a split-half reliability of .91. This figure varies somewhat from group to group:

Population	$r_{II}$	N
University of Buffalo (summer session)	.95	46
University of Pittsburgh (summer session)	.87	178
Clark University, Dartmouth College, Woods Hole Marine Biological Laboratory, and miscellaneous	.97	43

A group of 36 University of California students who attended both the summer and fall sessions, 1932, gave a test-retest reliability of .89, with an interval of about 2½ months. All these populations are of varied sex and age composition, with a preponderance of women and young persons (third decade). Of the 36 California students (28 females), 20 increased their scores, 10 decreased them, and the remainder were within the same five-point classes; this illustrates a tendency which will be discussed in greater detail later. The time necessary for administration proved to be about 10-15 minutes.

### VALIDITY

The major task of establishing validity in any measure of personality must be a clinical one; but it is possible to compare each item with the total score, thus deriving a measure of internal consistency. This is the method used by Thurstone in the derivation of the original scale (4), and by Root in the validation of his short introversion-extroversion test (2); the manner of derivation of this Revision makes the use of this method here especially advantageous, since the findings indicate that the Revision now measures a trait that is approximately unitary in a psychological sense.

<sup>1</sup>For the securing of these data I am indebted to the kindness of the subjects and of Drs. N. L. Munn, O. L. Harvey, H. E. Jones, V. A. Jones, and M. N. Crook; Messrs. C. M. Pomerat and D. Shakow; and Miss P. Seckler.

<sup>2</sup>Blanks and accessory data may be procured from the author.

The total score range was divided into five classes, as follows:

A	0-14
B	15-24
C	25-39
D	40-54
E	55-100

These correspond, in a mixed population, to percentages of about 10, 20, 40, 20, and 10, respectively. The number of 0, 1, 2, 3, and 4 responses for each item for each class was counted for the sexes separately; from these data was computed the average value of the responses for each item by each class and sex. These averages are given on page 93.

It is evident that there is a reasonably close relationship between the diagnostic value of the items and that of the scale as a whole. Particularly well-spaced items are numbers 4, 13, 14, 18, 19, 20, and 21 for the women, and 13, 14, 19, 20, and 21 for the men; poorly spaced ones are 1, 10, 11, 15, and 23 for the women, and 1, 11, 12, 17, and 18 for the men. Those common to both sexes are:

*Well spaced*

- 13 Does it bother you to have people watch you at work even when you do it well?
- 14 Does criticism hurt you badly?
- 19 Are you often lonely?
- 20 Are you self-conscious before superiors?
- 21 Do you lack self-confidence?

*Poorly spaced*

- 1 Do you get stage fright?
- 11 Do you like to be alone?

Under validity should be mentioned the possibility that the scores may include a suggestion effect due to the form of the questions (which was adopted in order to make total scores directly indicative of degree of maladjustment, without conversion). This *a priori* clinical suspicion is to some extent confirmed by results reported by Smith at the 1932 meeting of the American Psychological Association (3); he obtained markedly different results from the same subjects on questionnaire material resembling that here under consideration, depending upon whether the questions were worded positively or negatively; and he concluded that the former wording is the more valid and reliable.

DISTRIBUTIONS

The mean of a distribution of 262 mixed cases from Buffalo, Pittsburgh, and Clark-Woods-Hole-Dartmouth is 32.5, and its standard deviation is 15.2; it is, of course, skewed upward. The mean for the 119 male cases



Item	Male Class					Female Class				
	A	B	C	D	E	A	B	C	D	E
1	1.0	1.1	1.5	1.9	1.9	1.0	1.0	1.6	2.0	1.7
2	1.0	1.4	1.8	2.3	3.3	1.0	1.3	2.0	2.7	3.1
3	2.8	1.0	1.7	1.8	2.4	.2	1.8	1.6	1.8	2.6
4	.8	1.5	1.7	2.5	2.9	.4	1.4	1.8	2.3	3.1
5	.9	1.4	1.9	2.5	2.9	.5	.9	1.0	2.0	2.6
6	.2	.5	.8	1.8	2.1	.2	.7	1.2	1.6	2.4
7	.3	.5	1.3	1.5	2.9	.3	.5	1.0	1.5	2.2
8	.5	1.1	1.5	2.1	2.7	.6	1.0	1.6	1.9	2.5
9		.9	1.1	1.7	2.7	.2	.6	1.1	1.8	2.4
10	.5	1.5	1.3	1.5	2.4	.7	1.0	1.8	1.9	2.2
11	.9	1.3	1.8	2.1	1.7	.9	1.0	1.4	1.3	2.3
12		.3	.4	.7	1.4	.1	.6	1.1	1.6	1.9
13	.1	.4	.8	1.6	3.0	.2	.3	1.4	2.8	2.5
14	.5	1.0	1.4	2.0	3.0	.3	.8	1.4	2.3	2.7
15	.2	.4	1.6	1.4	2.6	.1	.3	.9	.7	1.3
16		.3	.8	1.5	1.9	.1	.4	.6	1.1	2.3
17	.2	.6	.8	1.6	2.0	.1	.7	1.0	1.3	2.3
18	.5	.6	1.6	1.9	1.7	.1	.7	1.7	2.5	2.7
19	.2	.6	.8	1.6	3.0	.1	.7	.7	1.3	2.6
20	.6	1.0	.7	2.9	3.3	.2	.7	1.3	2.3	2.9
21	.2	.8	1.4	2.1	2.7	.3	.6	1.1	2.4	2.9
22	.6	.9	1.0	2.3	2.9	.7	1.1	1.7	2.5	2.4
23		.2	.6	1.3	2.1		.5	.4	1.2	1.2
24	.1	.6	1.9	1.7	2.1	.3	.6	.8	1.9	2.3
25	.2	.7	1.0	2.0	2.1	.1	.6	.9	1.7	2.3
N	18	30	46	15	7	14	28	50	41	19

of this distribution is 28.9, and the standard deviation 13.7; the corresponding figures for the 143 female cases are 36.1 and 15.8. The latter curve shows a tendency toward bimodality. The figures for the groups composing this total, and for certain other groups, are:

Population	N	M	$\sigma$
Columbia I, males	14	25.9	11.5
females	37	34.1	15.9
both sexes	52	31.3	15.1
Columbia II, males	8	27.0	16.2
females	9	36.4	20.7
both sexes	22	29.5	18.0
Columbia I and II	74	30.8	16.0
Clark-W-H-D, males	23	30.3	12.9
females	20	31.0	17.6
Buffalo, males	35	25.7	12.8
females	11	32.1	22.1
Pittsburgh, males	61	30.2	14.1
females	112	36.6	14.5
California (28 females, 8 males)	36	31.2	15.0

The following smoothed percentile curves (Figure 1) (actual data are indicated by small circles and crosses) represent the data with approximate accuracy, and may serve as a table of norms. As a matter of interest it may be added that the lowest score so far observed is 2 and the highest 83; both of these were made by women.

#### AGE AND SEX VARIATIONS

A feature of great interest in the present data is a curvilinear relationship between age and score in the female, which is matched only by a steady decline in the male. Since this is a matter of importance, all the data now in hand will be presented, and the results exhibited graphically in Figure 2 below. It is of interest that similar results were obtained by the writer, (6) with the unabridged Thurstone on a married population, so that it is unlikely (the present population being almost exclusively unmarried) that the factor of marriage is involved. In interpreting the graph it must be borne in mind that the variability of arrays is considerable; the middle 50% of the cases lie in a band about 16 points wide, of which the median curve shown is the approximate center; within any given array there is comparatively little skewness, so that the curve for means would approximate that for medians rather closely. The peak of the curve closest to the lower quartile points is about four years before that shown for the medians, and that for the upper quartile about four years later, in the females; the males show no comparable trend.

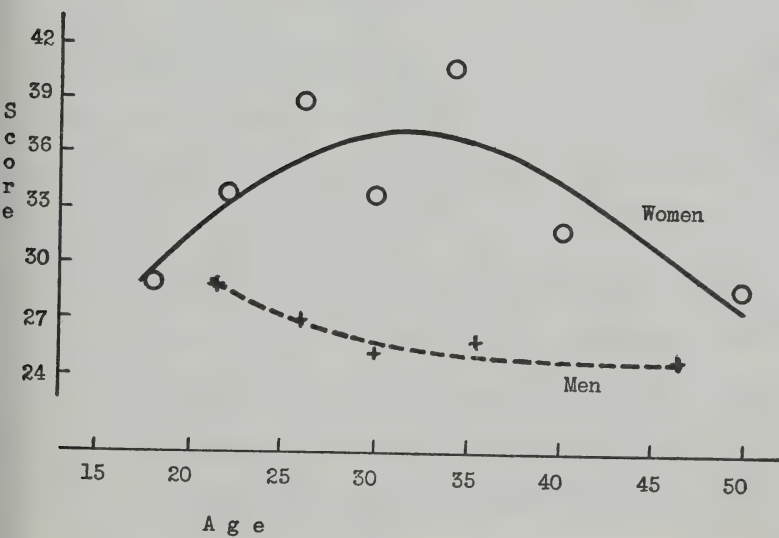
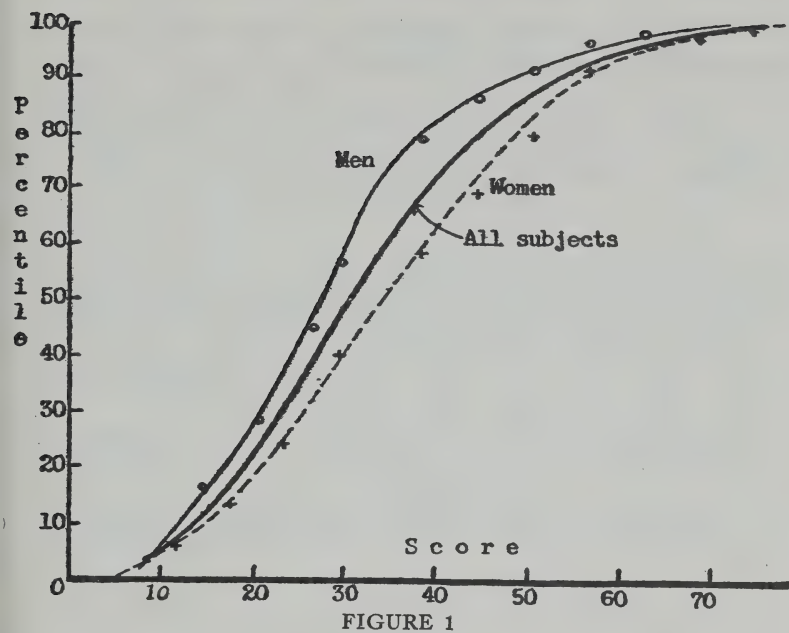


FIGURE 2

The frequencies of age classes, grouped in four-year intervals (the class index being the lower limit of the interval), are:

	16	20	24	28	32	36	40	44	48	52	56	Total
Males	9	42	41	21	19	10	7	6	2	1	1	157
Females	31	70	42	32	21	14	13	4	6	6		239
												396

These classes have been grouped in such a way as to leave no class with a frequency less than 16 (this being the figure necessary to yield a maximal P.E. of about 2 points for each mean) and the abscissae for the resulting composite classes have been obtained by averaging the ages of their members. Thus, in the males, classes 16-20, 24-40, and 44-48-52-56 have been combined; in the females, classes 36-40 and 44-48-52.

No satisfactory explanation can be given for the phenomena recorded by the graph; but it may be observed that such a result as that indicated for the women could be expected from the multiplicative interaction of two entities one of which increased while the other decreased in amount with time, thus:

A	1	2	3	4	5	6	7	8	9
B	9	8	7	6	5	4	3	2	1
Product	9	16	21	24	25	24	21	16	9

It appears at least possible that a beginning upon this very suggestive problem might be made by an investigator (perhaps an endocrinologist) who would search for two such interacting entities, peculiar to the feminine constitution, which waxed and waned respectively with age and attained approximate equality in the early thirties.

It will be noted that in this suggestion the assumption is implicit that trends in the age-score curve imply secular change in individuals; this is the assumption to which exception has been taken by Johnson (1) in his recent attack on interpretations of Thorndike's findings concerning the relationship of learning to age; in our opinion no such general attack is warranted, and the assumption is justified if employed consciously and cautiously. It is correct that the argument is not as strong when so based as if individuals had been measured over the period under discussion; but to assert that successive samplings showing a consistent trend imply nothing regarding growth is equivalent to maintaining that the samplings or the populations sampled at each age level differ in a systematic way, and to maintain this without supporting evidence, or even in the face of evidence that the randomness of samples was adequately safeguarded, is clearly unreasonable.

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## GENERAL AND SPECIFIC FACTORS IN CHARACTER\*

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The purpose of this paper is to present the results of an analysis of correlations obtained from measures of several aspects of character and the application of Spearman's tetrad difference criterion to these correlations.

One of the most extensive researches in the field of character measurement has been the Character Education Inquiry which was directed by Drs. Hugh Hartshorne and Mark May and conducted at Teachers College, Columbia University. During its five years of activity, the Inquiry devised and employed more than one hundred different tests and scales. The character tests may be classified roughly into two categories: moral knowledge tests and moral behavior tests. The former consisted of measures of information concerning right and wrong, familiarity with social conventions and accepted standards, foresight of consequences, comprehension of ethical principles, and the command of a social-ethical vocabulary. The behavior tests consisted of measures of conduct in situations involving moral problems.

The present analysis will deal largely with the results of the behavior tests of the Character Education Inquiry. From the social point of view, moral behavior is of greater significance than moral knowledge. The factor analysis was applied to the correlations among four composite measures of character.

1. *Tests of Honesty*.<sup>1</sup> These included a great variety of test situations, involving opportunities for honest or deceptive behavior. Among the most significant methods of testing honesty were the following:

\*Abstract of paper read at the Tenth International Congress of Psychology, Copenhagen, August, 1932.

<sup>1</sup>See Hartshorne and May (1).



*a. Double testing technique.* A test is given and the children are allowed to score their own papers by means of a key. They are told that they must not copy the answers from the key. They are retested later under controlled conditions by means of equivalent tests. A striking difference between the scores on the two tests indicates that a child copied the answers from the key when he was entrusted with it to score his paper. Similarly the children are given a test to take home and to fill out without accepting help. An equivalent test is given subsequently in the classroom. The difference in score indicates the extent to which the child did accept help at home.

*b. Improbable achievement technique.* The children are presented with the difficult task of tracing complicated mazes with their eyes shut. Success on this test, which beyond a certain degree was found to be impossible, indicates that a child did not comply with the directions and thus accepted credit unfairly.<sup>2</sup>

*2. Tests of Cooperation and Helpfulness.* Several tests were used for this composite score.

*a. The Efficiency Cooperation Test.* This is based on a comparison of a child's speed of work when working in a contest between groups, without writing his own name on his paper, and his speed when working for a personal prize.

*b. The Free Choice Test.* This is given immediately after the Efficiency Cooperation Test. A child is given the opportunity to have his work count either toward his group score or toward his personal score.

*c. The Contribution Test.* Boxes containing ten school articles each, such as drinking cup, pencil sharpener, etc., were given to each member of the class as a present from a friend of the school. An appeal was then made to send these articles away to poor children who do not possess them. A child was given the opportunity to give away, in an inconspicuous manner, any part, all, or none of the articles received. The amount given was checked up without the child's knowledge.

*d. The Helpfulness Test.* Each child was provided with a letter in which an appeal was made for pictures and other material to be sent away to children in hospitals. Four envelopes were given out in which a child was to place jokes, puzzles, stories, and pictures, respectively. The children were allowed ten days to bring in their contributions, during which period the teacher mentioned the matter three times. The great variety of things handed in were given score values from which a score of helpfulness was computed for each child.<sup>3</sup>

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<sup>2</sup>See also Maller (5).

<sup>3</sup>These tests are described by Hartshorne, May, and Maller (2). See also Maller (4).

3. *Inhibition Tests.* Among these were several tests of distraction. One of these consisted of a series of tests of simple additions dispersed with numerous distractions, pictures, and puzzles. The degree of distraction was measured by the decrease in speed. During another test, little boxes of candy were placed on the desk of each child at the beginning of an arithmetic test, but the directions were not to partake of the sweets before the completion of the test. The weighted scores of the several inhibition tests were combined into one composite.

4. *Persistence Tests.* These included a task of reading a story printed in run-in type, thus requiring a great deal of attention and effort. The child was allowed to stop work at will and the score was the length of time voluntarily devoted to this task. Similar measures involved the length of time devoted to attempts at solving a difficult puzzle. Another measure of persistence was based on the level of speed when working for an hour at the monotonous task of simple additions.

*Population Tested.* The above four groups of tests were administered under uniform conditions to 708 pupils of three schools. These schools represented the upper, middle, and lower social economic level. They will be referred to as Populations X, Y, and Z, respectively.

*Variability.* The distributions of scores on the four measures of character were consistently unimodal and in some cases approach the normal curve. In no case was there found a dichotomy dividing the individuals into two groups, honest and dishonest, or cooperative and uncooperative.

*Intercorrelations.* The correlations among the four character tests are shown in Table 1. The correlations are given for the three groups representing children of different social economic status. These populations differed so much from one another on these tests that it was considered unwarranted to put them together for the purpose of correlations. It should be noted that these correlations are only for composite scores<sup>4</sup>

The correlations reveal two significant facts concerning the relationship between different phases of character. All the correlations are positive. Apparently such aspects of character as honesty, cooperation, inhibition, and persistence seem to be positively related and to go together to some extent. In no case were these measures negatively related.

The second observation is the consistently low magnitude of the correlations, the average correlation being about .24. These are considerably lower than the correlations usually found among different measures of mental ability. Granted that each of the character tests measures reliably some important aspect of character, the low intercorrelations add to the value of the total scores based on these tests.

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<sup>4</sup>The correlations are from Hartshorne, May, and Shuttleworth (3).

TABLE 1  
CORRELATIONS AMONG FOUR COMPOSITE SCORES OF CHARACTER TESTS  
*a. Population X. N = 196.*

	Honesty	Cooperation	Inhibition	Persistence
Honesty		.213	.236	.083
Cooperation	.213		.274	.109
Inhibition	.236	.274		.091
Persistence	.083	.109	.091	

*b. Population Y. N = 255.*

	Honesty	Cooperation	Inhibition	Persistence
Honesty		.133	.361	.358
Cooperation	.133		.220	.219
Inhibition	.361	.220		.240
Persistence	.358	.219	.240	

*c. Population Z. N = 256*

	Honesty	Cooperation	Inhibition	Persistence
Honesty		.273	.243	.186
Cooperation	.273		.370	.063
Inhibition	.243	.370		.215
Persistence	.186	.063	.215	

TABLE 2  
TETRAD DIFFERENCES RESULTING FROM CORRELATIONS AMONG  
CHARACTER TESTS

	$t_{1234}$	$t_{1243}$	$t_{1432}$	P.E. <sub>t</sub>
Population X	— .0063	— .0034	— .0030	.0213
Population Y	— .0471	— .0468	— .0003	.0194
Population Z	.0434	— .0101	.0535	.0193

The tetrad differences resulting from the correlations of Table 1 were computed for each of the three populations. These are shown in Table 2. The P.E. of each set of tetrads was computed by formula 16a of Spearman's *Abilities of Man* (Appendix, p. xi). This is the square root of the mean of the squared P.E.'s of the individual tetrads.

It will be seen that the tetrad differences are extremely small and in no instance more than three times the respective P.E.'s. This holds true in each of the three populations. The tetrad criterion is thus satisfied and the correlations may therefore be considered as due to one factor common to these four phases of character. A response on each of the tests may be looked upon as composed of one element common to the responses to all the tests, and constant for any individual, plus a specific element varying from test to test.

*Relation to Intelligence.* The scores on the above character tests were correlated with two measures of mental ability. The tetrad differences resulting from these correlations were large. This indicates that the factor common to these behavior tests can in no way be identified with *g*. What, then, is this common factor?

An examination of the situations constituting the four groups of character tests reveals that each of them involves some form of conflict between interests. In each case the "right" response, determined by those who constructed the test, requires the subordination of the immediate interest to one that is remote but superior in nature. Thus, in the honesty tests there is the conflict between the desire to excel and the social gain resulting from fair play. The tests of cooperation involve a conflict between personal and social interests. In the tests of persistence and inhibition the conflict between the immediate stimulus and the remote goal is obvious.

We may therefore say that the factor common to the various character tests, which may be referred to as factor *C*, is the readiness to forego an immediate gain for the sake of a remote but greater gain. The latter may be remote in time and greater in the sense of leading to other gains of greater magnitude, or it may be remote in being social rather than personal and greater in the sense of affecting a greater number of individuals.

The proof of the existence of a general factor common to these aspects of character as well as the value of this factor, if proven to exist, is seriously affected by the low magnitude of the intercorrelations. This, however, is partly due to the imperfection of the tests in their experimental forms. It is likely that in the light of the results of these tests other attempts will be made toward the construction of character tests of greater reliability and of more definite validity. Such carefully prepared tests will undoubtedly show higher correlations and will probably be as good measures of general character as mental tests are measures of general intelligence.

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## A COMPARISON OF THE EFFECTS OF LAX VERSUS STRICT HOME TRAINING\*

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In connection with another study, seeking light on some of the symptoms and difficulties of "normal" people, 230 graduate students in education, median age 30, voluntarily filled out elaborate self-description blanks. They were asked, in the interests of scientific knowledge, to answer frankly and objectively some 200 questions which could be answered with "Yes," "?," or "No." They were urged to leave blank any question they preferred not to answer rather than to give an answer which might be misleading. Actually, practically all blanks were complete.

The "strict"-home-training group, in this study, is made up by selection of the quarter of our total population most apt to show the following characteristics:

Sometimes punished very severely  
Sometimes felt like running away from home  
Times when child hated father  
Times when child hated mother  
Sometimes punished unjustly  
Felt socially handicapped during adolescence because home set up higher standards of recreation and social life than were required for other young people  
Mother tried to plan life for child  
Father tried to plan life for child  
Amusements and recreations strictly supervised  
Many times felt like running away from home  
Father was unusually stern or strict  
Mother was unusually stern or strict  
Child over-protected from knowledge of the evils of life  
Did not talk over adolescent "dates" freely with either parent  
Was held to regular chore and study habits at home  
At age 10 to 12 still had regular bed time insisted upon  
Required to attend Sunday School and church whether child wished to do so or not

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\*Abstract of paper read at the Tenth International Congress of Psychology, Copenhagen, August, 1932.



The group known in this study as the "lax" group consisted of the quartile least likely to report such items as those above. The "strict" quartile averaged 60% possessing each of the above 17 items; in the average group the tendency was for about 40% to show each characteristic; in the "lax" group the average item was claimed by only 15% of the group.

A check on the frankness of answer may be made from 16 items in which more or less shameful acknowledgments were required. In general, 90% admitted having told lies, 95% confessed to having been irritated by their parents, 75% were at times reluctant to go to school, 50% had cheated on examinations, 50% had had thoughts of suicide, 25% had had childhood sex experiences, and about the same proportion had such experiences at adolescence. The average percentage of answers favorable to the subject's own respectability was 27% in the lax group, 23% in the middle group, and 19% in the strict group. It would seem that admissions are approximately as frequent as should be expected in the light of other more objective studies and that there is no great difference between groups in willingness to admit unpleasant truths about themselves.

The strict group showed much more dislike of parents. Rude answering (76% in the strict group as compared with 29% in the lax group), irritation (98% to 72%), and being ashamed of parents (48% to 24%) were significantly more common in the strict group.

The combative attitudes developed in relation to parents were apparently carried out into other relationships. Feeling that teachers had been unfair to them (36% to 12%), grudges against some people (55% to 26%), quarrels with friends (93% to 71%), problems of strength of will and control of temper (difference more than twice its S.D.), all point to more quarrelsome attitudes in the group given strict home training.

A third general characteristic of the strict-home group was their infantile dependence. They were more bothered by bashfulness in a serious way and over a long time (52% to 23%), more apt to be finicky about foods (31% to 7%), more apt to feel themselves lacking in self-control (17% to 2%), more curious about sex matters (60% to 35%), more apt to wish they were little again (33% to 16%), less apt to decide upon vocation while in high school or college. At age 15 twice as many (24%) of the strict group as of the lax group would have been homesick if away for a week in camp or with friends. Despite their dislike of home, they were even more uncomfortable with other people.

As a consequence of the hatred of parents, the combativeness, and the dependence, the group from strict homes was much more apt to be socially maladjusted than were those from lax homes. The group from lax homes was more apt to have many friends (93% to 67%) and to enjoy the subtle social competition of parties (47% to 31%). The group from strict homes was distinguished by having had several broken engagements

(26% to 7%), having been called unpleasant nicknames (26% to 12%), being much teased by other children (14% to 7%), cherished deep and lasting hurts from things said or done by associates (62% to 37%). A contributing factor was probably the fact that 21% of the strict group, as compared with 12% of the lax group, associated little with other children.

A fifth general characteristic of the strict-home group was their tendency to guilt, worry, and anxiety, quite in accord with what the Freudian theory of the super-ego would lead us to expect. They worried a great deal (64% of the strict group to 21% of the lax group), had many childhood fears (52% to 14%), worried over low marks when they happened to receive them (55% to 36%). Thirty-eight per cent of the strict-home group, as compared with 23% of the lax-home group, had been much troubled by thoughts of going to hell. Worry over sex experiences, sex thoughts, and sex dreams similarly characterized the group from strict homes rather than the group from lax homes. Among the other symptoms of emotional maladjustment related to strict home training may be mentioned fear of closed spaces or wide open spaces, sensitiveness, speech defects, excessive day-dreaming, exorbitant ambitions, dreams of people being dead, recurring dreams, troubled sleep, a feeling that things are not real, play with imaginary playmates.

The physical inferiority which appeared in the group from strict homes may have been the cause of the over-careful supervision, or, on the other hand, a kind of hypochondria resulting from over-close attention. Probably both factors operated. Being underweight (36% to 10%), feeling physically handicapped in relation to other playmates (24% to 0%), feeling that health was neglected during childhood (19% to 2%), having been a sickly child (24% to 5%), having had many severe headaches (38% to 19%), all point in the same direction, showing more symptoms in the group from strict homes. No difference appeared on specific diseases mentioned, on heart trouble, fainting, hearing defect, lameness, convulsions, or enuresis. There was no factor of physical disorder more frequent in the group given less careful oversight.

As a result of physical inadequacy, emotional maladjustment, poor social relations, etc., it is not surprising to find that the group from strict homes were much more unhappy. They thought of themselves as having had an unhappy childhood (43% to 7%), they cried very easily (54% to 32%), they felt life at home was unhappy for some younger sibling (24% to 7%), they thought frequently and seriously of suicide (19% to 10%).

It is interesting to note that, despite the strict home training, the attempt to domineer over the entire life of the child, the children from these homes were not really better protected against the very evils from which conscientious parents attempted to shield them. Their physical health was no better, probably worse. They played with undesirable gangs, did things

which might have resulted in charges of delinquency if known, received poor deportment marks in school, stole, and lied, with just the same frequency as the group from lax homes. Experiences of sex relations before adulthood appeared twice as frequently in the group from strict homes as in the group from lax homes.

The only factor in the entire list which turned out to favor the group from strict homes was a tendency to rank among the top 2 or 3 in school class, reported by 69% of the group from strict homes and 55% of the group from lax homes. School failure or poor marks were equally common in both groups.

Some of the answers seemed to point to factors which might cause the severity in home discipline. Thus 81% of the group from strict homes and only 33% of the group from lax homes reported that the parents were unhappily married. Divorce or separation appeared in 24% of the strict homes and 7% of the lax homes. Step-parents, interestingly enough, were not sources of severity. Twenty-one per cent of the lax group as compared with 7% of the strict group were brought up by step-parents. Old-fashioned religious ideas were more common in the strict homes (60% to 14%). Social and economic handicaps were also more common in the strict homes (40% to 8%).

The picture given us by these data is that of old-fashioned homes, economically under-privileged, with poor marital adjustments leading to severity in handling children, which produced, thirty years later, adults who hated their parents, quarreled with associates, were unable to live on a mature and independent basis, were socially maladjusted, full of over-conscientiousness, guilt, and fears, were inclined to be sickly, and definitely unhappy. The data do not demonstrate that the causal factor was the home training. Certain hereditary taints may conceivably have produced social inadequacy in the parents leading them to carry on their homes as they did, and similar social inadequacy in the offspring. Experience with children placed in foster-homes makes it highly probable, however, that the type of home training is an effective factor in producing the attitudes here shown to be characteristic of strict as contrasted with lax home discipline.

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## SEX DIFFERENCES IN VALUATIONAL ATTITUDES

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Psychologists have long recognized that the differences between the sexes in most mental functions are either exceedingly small or of questionable human significance. Without exception, all laboratory studies show that variations in performance *within* the male and female groups are far greater than those occurring between their respective means.<sup>1</sup> It has therefore been concluded that in all matters pertaining to the practical treatment of men and women less emphasis should be placed upon the fact of sex classification and more upon the individual's personal fitness.

However desirable this interpretation may have been in facilitating a certain kind of social progress, its scientific validity may still be questioned. Even though relatively small differences have been found in the speed, accuracy, and level of attainment in an endless number of narrow sensory, motor, and intellectual activities, it does not follow that sex differences are meaningless or the entire problem an artificial one. A hint from configurationism would suggest that the pattern or organization of "traits" in men and women may be *typically* different. Two wholes comprised of the same parts are not necessarily alike unless certain unifying relations are also present. The way in which capacities for behavior are assembled in the male and female may conceivably be the decisive factor making for masculinity or femininity. Even if one maintains the analytic bias, it seems plausible that a summation of small differences will yield quite distinct totals.

At first glance, this notion appears to run counter to the results of physiological experiments on castration, transplantation of reproductive glands, injection of hormones, etc. Virchow is alleged to have said, "A woman is a woman because of her ovaries," but it is obvious that these bodies themselves acquire their significance from their *interrelations* with the entire organism. However womanish a eunuch may seem to be, he is still far from creating the "total" impression of a female. Instead of weakening the *Ganzheit* approach, such experiments and observations tend but to confirm its fundamental thesis that a change in any vital part does not have purely local effects but alters notably the constitution of the whole.

While it is presumptuous to claim that an application of this viewpoint will revivify the somewhat sterile field of sex differences, it should serve to motivate a modified style of experiment and interpretation. The present report is an attempt to apply this theoretical position with the aid of

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<sup>1</sup>For a useful recent summary of such studies see Allen (1).



the Allport-Vernon scale of values test.<sup>2</sup> This blank is a novel effort to reduce Spranger's personality schema to standardized report and score form and yields individual profiles showing the relative strength and weakness of a limited number of well-defined universal attitudes.<sup>3</sup> The choice of this particular measuring instrument was dictated by the following considerations: It has been suspected for some time that if ever noteworthy sex differences are to be revealed they must be sought in the emotional or temperamental aspects of life; and if temperament be taken to refer to "general" characteristics pervading personal behavior this is highly probable in the light of our hypothesis. The implication, of course, is that significant sex differences should be revealed in such broad fundamentals as *Weltanschauung*, dispositions, sentiments (in Shand's sense), value hierarchies, etc. A similar suggestion—masked though it be by the terminology of a doubtful account of native behavior—is found in the following passage from Thorndike (3, pp. 202-203):<sup>4</sup>

"It would be desirable that the sex differences in the instinctive acts, interests, aversions, and emotional responses should be studied apart from the differences in similar traits that have been produced by circumstances. Two instincts are worthy of special attention. The most striking difference in instinctive equipment consists in the *strength of the fighting instinct in the male and of the nursing instinct in the female*. No one will doubt that men are more possessed by the instinct to fight, to be the winner of games and serious contests, than are women; nor that women are more possessed than men by the instinct to nurse, to care and fuss over others, to relieve, comfort, and console. And probably no serious student of human nature will doubt that these are matters of original nature. The out-and-out physical fighting for the sake of combat is preeminently a male instinct and the resentment at mastery, the *zeal to surpass and the general joy at activity* in mental as well as physical matters seem to be closely correlated with it. It has been common to talk of women's 'dependence.' This is, I am sure, only an awkward name for less resentment at mastery. The actual nursing of the young seems likewise to involve equally unreasoning tendencies to pet, coddle, and 'do for' others. The existence of these two instincts has been long recognized by literature and common knowledge, but their importance in causing differences in the general activities of the sexes has not. The fighting instinct is in fact the cause

<sup>2</sup>Allport and Vernon (2). The reader should be careful to remember the special meaning attached to each of the six major personality types involved.

<sup>3</sup>Despite the ambiguity which surrounds the word "attitude," it is safe to say that the researches of the last few years concerning innumerable attitudes have all dealt with much larger and more generalized biosocial integrations. Studies of radicalism-conservatism, e.g., are less interested in particular responses pertaining to public ownership, nationalism, etc., than in the usefulness of such items as symptoms of complex permanent adjustments. Knowing the "structure" of the attitude one can predict with fair certainty the responses to related issues.

<sup>4</sup>The italics are my own.



of a very large amount of the world's intellectual endeavor. The financier does not think merely for money nor the scientist for truth nor the theologian to save souls. Their intellectual efforts are aimed in great measure *to outdo the other man, to subdue nature, to conquer assent*. The maternal instinct in its turn is the chief source of woman's superiorities in the moral life. The virtues in which she excels are not so much due to either any general moral superiority or any set of special moral talents as to her *original impulses to relieve, comfort and console*.<sup>5</sup>

If we bring Spranger's conception of personality into juxtaposition with Thorndike's views on the differences in *intensity* of certain aspects of original nature in both male and female, then the following *a priori* prediction would appear to be justified: On the Allport-Vernon scale of values test, men should have a higher average theoretical score (since they are presumably more concerned with ideas than women); men should be higher in the economic aspect (being also more interested in things and in "subduing nature"); women should have a higher mean aesthetic score (because of the power of the beautiful to bring peace and to relieve suffering in subtle ways); women should have a greater number of the social type (by virtue of a stronger tendency to be interested in people and to "comfort and console" them); men ought to exceed in the political division (on account of their greater aggressiveness and "combativeness"); and women should be more numerous in the religious group (since they are said to be more docile and submissive).<sup>5</sup>

The experimental check was provided by the following data secured from 186 women and 207 men, all students of sophomore standing or beyond, at the Pennsylvania State College. This represents a sampling of approximately one out of every ten undergraduates. The test booklets were administered and scored as part of a larger related project. In Table 1 will be found all the statistical constants necessary to an exhaustive comparison of the two groups in each of the six personality types. According to the norms given by Allport for his original population, 30 represents the mean score in each division of the profile.

It will be noticed that all the differences between the means are in the expected directions and that they meet the conventional test of reliability (with the exception of social-mindedness, which, however, approaches very closely the usual requirement). Men seem, on the whole, to be more theoretical, economic, and political; and women, more aesthetic, social, and religious. This confirms the current bourgeois stereotype of the sexes as it is applied without respect to variations in educational level—an interesting enough fact when one considers the highly intellectualized framework within which Spranger has established his types.

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<sup>5</sup>Contrary to usual practice in personality schedules (as in the ascendance-submission scale), the Allport-Vernon blank does not provide separate norms for the sexes.

TABLE 1

SEX DIFFERENCES IN SIX FUNDAMENTAL LIFE-ATTITUDES OR PERSONALITY  
TYPES (SPRANGER) AS INDICATED BY SCORES ON THE ALLPORT-VERNON  
SCALE OF VALUES TEST OF APPROXIMATELY 200 MEN  
AND 200 WOMEN

Type	Constant	Men	Difference	Women
A. Theoretical	Mean	32.08		28.30
	S. D.	4.57		6.57
	S. D. <sub>av.</sub>	.32		.48
	Median	32.31		27.40
	Range	33	(49-16)	38 (50-12)
	C. V.	14.25		23.22
	Skewness	—15		.41
	Difference		3.78	
	S. D. <sub>diff.</sub>		.57	
	Critical ratio		6.60	
B. Economic	Mean	31.44		29.09
	S. D.	6.84		5.58
	S. D. <sub>av.</sub>	.47		.41
	Median	31.97		29.07
	Range	41	(52-11)	37 (45-12)
	C. V.	21.76		19.18
	Skewness	—23		.01
	Difference		2.35	
	S. D. <sub>diff.</sub>		.62	
	Critical ratio		3.79	
C. Aesthetic	Mean	26.49		31.11
	S. D.	8.43		8.28
	S. D. <sub>av.</sub>	.59		.61
	Median	25.37		29.90
	Range	47	(55-8 )	45 (55-10)
	C. V.	31.82		26.62
	Skewness	.40		.44
	Difference		4.62	
	S. D. <sub>diff.</sub>		.79	
	Critical ratio		5.85	
D. Social	Mean	28.99		30.70
	S. D.	6.06		5.45
	S. D. <sub>av.</sub>	.42		.40
	Median	29.23		31.07
	Range	33	(44-11)	27 (44-17)
	C. V.	20.90		17.75
	Skewness	—38		—19
	Difference		1.71	
	S. D. <sub>diff.</sub>		.58	
	Critical ratio		2.95	

E. Political	Mean	33.12		30.03
	S. D.	6.71		5.97
	S. D. <sub>av.</sub>	.47		.44
	Median	33.05		29.82
	Range	38	(52-14)	35 (45-10)
	C. V.	20.26		19.88
	Skewness	.31		.11
	Difference		3.09	
	S. D. <sub>diff.</sub>		.64	
	Critical ratio		4.83	
F. Religious	Mean	30.50		33.65
	S. D.	8.64		8.06
	S. D. <sub>av.</sub>	.60		.59
	Median	30.50		33.77
	Range	50	(58-8)	40 (52-12)
	C. V.	28.33		23.95
	Skewness	0		— .12
	Difference		3.15	
	S. D. <sub>diff.</sub>		.84	
	Critical ratio		3.75	

The approximate normality of all distributions—as evidenced by the smallness of the indices of skewness—enables one to apply the measures of overlap with maximum confidence. Employing the standard method of comparison, we find that 76.23% of the males reach or exceed the *theoretical* median of the females, 63.15% reach or exceed their *economic* median and 64.45% surpass their *political* median; conversely, only 32.16% of the men reach or exceed the *aesthetic* median of the women, 36.38% excel their *social* median; and 37.60% surpass the female *religious* median. The greatest superiority of the males is in the theoretical viewpoint, while the greatest superiority of the females lies in the aesthetic attitude.

The figures of Table 1 confirm in striking fashion the statistics which Allport and Vernon (1, p. 246) report incidentally without developing at any length. Why they failed to emphasize this point, particularly in view of the rarity of striking and consistent sex differences, is a bit of a mystery, but the complete verification of their findings makes these relations all the more worthy of consideration.

This paper makes no pretension of assessing the relative contributions of heredity and environment to these distinctive valuational positions. Thorndike would probably find some support for his instinctive explanation in these data, and the sociologist could appeal to the differentiating effects of a specialized milieu. If the latter explanation be adopted, it would imply that masculine environments are much less uniform than feminine, for, with the exception of the theoretical type, male variability

is greater in all respects. Curiously enough, the least difference in variability occurs in political-mindedness where the women are 98% as variable as the men. It is difficult to know just what significance to attach to this.

If we assume that the mean scores for each attitude indicate the order of merit of certain categories of "goods," then the contrast shown in Table 2 between the value hierarchies for men and women may be set up.<sup>6</sup>

TABLE 2

Rank	Male	Female
1	Political	Religious
2	Theoretical	Aesthetic
3	Economic	Social
4	Religious	Political
5	Social	Economic
6	Aesthetic	Theoretical

Although it is a bit absurd to apply the rank-difference method of correlation to these series, it may be suggestive that the coefficient is  $-.34$ . Odd as it may appear, feminine ideals and standards not only fail to run parallel with masculine values (taken as a group) but may even be opposed. The implications of this for differential motivation and incentive in curricular and occupational affairs must be obvious.

If we use the magnitude of the "critical ratio" as a measure of the relative amount of difference between the two groups, the descending order shown in Table 3 results. In other words, men and women differ less in

TABLE 3

Type	Critical ratio
Theoretical	6.60
Aesthetic	5.85
Political	4.83
Economic	3.79
Religious	3.75
Social	2.95

the last three "attitudes" than in the first three where the distinctions are more pronounced.

Why some objects or events of experience should consistently appeal

<sup>6</sup>The hidden assumption here is that the frequency with which preferential choices of a kind are made is an indirect measure of the intensity of the corresponding valuational attitude. Moreover, these value hierarchies hold only for young men and women of college age and may be different with middle-aged or elderly representatives of the two sexes. Under ordinary circumstances, these "mind-sets" appear to have an enduring character.

more strongly to women than to men is a complicated question which the data here made available do not help us to decide. What does seem to be a reasonable conclusion is that the various goods of life are fused into different intensity patterns depending upon the nature of the organism in which they reside. And one very important item affecting the nature of the resulting value organization is the biological cleavage represented by the fact of sex.

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## A "FOLLOW-UP" OF MENTALLY DEFECTIVE GIRLS

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The purpose of this study was to follow up a relatively large number of mentally deficient girls who, because of their age, were excluded from the special classes, in order that such knowledge might give a basis for a guidance program for these girls both in the special classes and upon leaving school.

Generally in the public-school system when a mentally deficient child reaches a certain age, usually 16, he is automatically excluded from the special class. This exclusion is necessary in order to keep such a special school a school rather than a detention institution. Robinson (11) states this position taken by the public schools as follows: "The public schools are training for citizenship, and a child who, because of very poor learning ability, will never be self-supporting or able to participate in civic life is an institution and not a public school problem." The school authorities at the time of such exclusion may notify the defective child for guardianship or for institutional treatment. Usually, however, when the child leaves school he is without any special supervision and permitted to drift until sooner or later his delinquency brings him to the attention of civic authorities (2; 9, pp. 460-574; 1, pp. 163-171, 203-217; 6, pp. 109-120).

Undoubtedly, a study of mentally deficient boys leaving the special classes would be most helpful to parents and to officers responsible for juvenile de-



linquency on the basis that such boys more often than girls become problem cases because of the freedom boys generally have in being more largely permitted to be away from the home and free from the supervision of the parents. It was, however, less difficult to trace girls after they had left school since girls are not as migratory as boys. It probably also is equally important to make a study of such mentally deficient girls because the proportion of defectives brought to the civic courts for sex offenses is perceptibly higher for girls than for boys. In fact, so generally does the mentally defective girl drift into sex delinquencies that unless placed under special supervision every mentally defective girl when she reaches adolescence may be considered a potential prostitute (9).

The general plan of the special classes<sup>1</sup> from which the subjects of this study were drawn was to admit girls of about 12 or 13 years of age with an intelligence score of 55 to 70 points IQ on the Stanford Revision of the Binet test; to give to each as much academic work as the pupil's ability permitted, supplemented by a great deal of manual work, which for the girls was largely cooking and sewing. The general rule for excluding pupils at the age of 16 to make room for other candidates always waiting for assignment was necessary. The 100 girls whose records are included in this study had been excluded from one to ten years before the study was made, their age range being from 16 to 26 years. The group was selected by taking in chronological order every girl who could be located from the last to leave until 100 girls were included in the study. Some of the records were quite complete but most of them were more or less fragmentary. However, information regarding the girls after leaving school which came from a doubtful source was rejected and every fact included in the study has been verified.

Since the training in this special class in most cases probably was the last opportunity for training (3) that these pupils had for their life's work it was interesting to note how many of them had become in any way self-supporting (14). Generally it is considered that female defectives more often than male defectives are found in more or less regular employment. Of the 100 girls included in this study only 19 had at any time been employed outside of their own home; 12 of these had found work in the local packing and poultry house; 1 had worked as a waitress in a third-rate restaurant; 1 had worked as a messenger girl in a department store; 3 had cared for children in the neighborhood; and 2 had worked as domestic servants in private homes. A number of others had worked outside of the home but had given such unsatisfactory service that the period of service was rarely longer than a few days and their employers could give no other information regarding them except that their services were unsatisfactory.

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<sup>1</sup>Sioux City, Iowa.

The family history of these delinquents shows that almost all of them came from families in which the father was an unskilled laborer. Only four came from families of which the father was of the professional class. Four were adopted children (4) and nothing was known of their own families, but in each case the foster father was an unskilled laborer. Thirty families were entirely self-supporting, but the 70 remaining families had at some time or other received aid from either city or county charitable organizations. The families from which the delinquents came ranged in size from 1 to 16 with an average of about 5 children to the family. At the time these data were collected (1928) the 15 girls then enrolled in the special class came from families which averaged 7 children to the family. Thirty-seven of the 100 pupils included in this study had brothers or sisters who had attended special classes for the mentally defective. All but 15 out of the 100 came from families who had some "blot" in the family history (2, 8, 11, 10), i.e., some members of the family had either been in a special school; had a police record; had relatives in the insane asylum, in the county alms house, in the industrial school, or in the state institution for the feeble-minded. Twenty-two of the girls included in this study had been before probation officers; 9 had given birth to illegitimate children; 5 had been committed to the state institution for the feeble-minded; 3 had died; 5 had been married and divorced; 29 had been married and were living with their husbands.

The data of this study give evidence that the mentally defective girl should be trained to be an asset to her immediate family or to the family in whose charge she is placed, since only a small percentage of such defective girls ever are able to obtain and hold a position outside the home with any degree of satisfaction.

Since by far the larger percentage of defective children come from families not entirely self-supporting and are themselves because of their delinquency a financial burden to the state and a detriment to society, it might be better for them and of less cost to the state to place them in an institution (8, 7) for care and protection as soon as they are excluded from the special classes in the public schools. This not being possible or advisable, undoubtedly both the children and society would be benefited if upon exclusion from the special class they were placed under the care of competent legal guardianship.

At first thought the 29 defective girls who married seemed to be satisfactorily taken care of. This may be the group in need of most serious consideration (1). Since "like begets like," and the mentally inferior, being of a low social economic status, generally have large families, these defective girls married are the source of a continued and continually increasing problem to society and financial burden to the state.

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## A QUANTITATIVE COMPARISON OF THE NATIONALITY PREFERENCES OF TWO GROUPS

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One of the most significant contributions to psychological methodology is Thurstone's application of the psychophysical methods to the measurement of attitudes. In a series of publications, Thurstone has discussed thoroughly the theory and technique of these methods and evidence of their usefulness is gradually accumulating. This study is presented as one more indication of the validity of his procedure for the measurement of attitudes.

In his article entitled "An Experimental Study of Nationality Preferences" (5), Thurstone undertakes to test the applicability of the "law of comparative judgment" to judgments of preference for nationalities. In order to do so he calculates how accurately the formula which he employs for measuring nationality preference, namely,  $S_1 - S_2 = X_{12}\sqrt{2}$ , fits the experimentally obtained data. The average discrepancy he obtains between the calculated and the experimental values is approximately 3% which indicates a very satisfactory goodness of fit.

In the study mentioned Thurstone does not undertake to determine how sensitive this method of measurement is for evaluating the differences of nationality preference that will pertain between different national groups. It is the purpose of this study to test the method in this regard.

Thurstone's study was based upon the judgments of 239 undergraduates at the University of Chicago. Our study deals with the judgments of 200 undergraduates at the University of Toronto. The procedure is the same in both investigations except for the introduction of "Canadian" as an additional nationality in the Toronto list. This was done in order to obtain a reference point for our scale, commensurate to "American," which Thurstone employs as a reference point for his scale.

Table 1 gives a comparison of the two groups of subjects.

The most marked differences between the two groups are, first, the high percentage of students of American birth and parentage in the Chicago group as compared with the Toronto group. The Chicago group shows 94.1% of the subjects, 62.8% of the fathers, and 68.2% of the mothers to be American-born. The figures for the Toronto group are, respectively, 6.1% of the subjects, 3.5% of the fathers, and 6.1% of the mothers American-born. The other pronounced difference is the higher percentage of students of British birth and parentage in the Toronto group as compared with the Chicago group. The Toronto group shows 90.5% of the subjects, 86.7% of the fathers, and 82.8% of the mothers British-born, whereas the figures for the Chicago group are 7.9% of the subjects, 10.5% of the fathers, and 6.7% of the mothers British-born. It is to be expected that such a disparity will

TABLE 1  
COMPARISON OF THE EXPERIMENTAL GROUPS

Country of birth	Chicago			Toronto		
	Subject	Father	Mother	Subject	Father	Mother
United States	.941	.628	.682	.061	.035	.061
Canada	.071	.046	.038	.859	.701	.722
England	.008	.042	.008	.036	.121	.076
Germany	—	.059	.063	—	—	.010
Ireland	—	.017	.021	—	.020	.010
Russia	.021	.100	.075	.010	.066	.066
Scotland	—	—	—	.010	.025	.020

## RELIGION OF SUBJECTS

Chicago		Toronto	
Jewish	.151	Jewish	.091
Protestant	.636	Protestant	.859
Catholic	.100	Catholic	.030
None	.113	None	.020

influence the nationality preferences of the groups. Our particular problem is to determine how successfully this influence will be indicated by the measurements obtained by employing Thurstone's method.

Table 2 gives a comparison of the scale values of the different nationalities

TABLE 2  
COMPARISON OF THE SCALE VALUES OBTAINED FROM THE EXPERIMENTAL GROUPS

Nationality	Chicago	Toronto	Difference
Canadian	not included	0.0000	—
American	0.0000	—1.5570	—1.5570
Englishman	—1.3413	—1.1013	+ .2400
Scotchman	—2.0962	—1.7868	+ .3094
Irishman	—2.1812	—1.9095	+ .2717
Frenchman	—2.4651	—2.5046	— .0395
German	—2.5570	—2.9225	— .3655
Swede	—2.9079	—3.3722	— .4643
South American	—3.6415	—4.0500	— .4085
Italian	—3.6684	—3.7851	— .1167
Spaniard	—3.7926	—3.8283	— .0357
Jew	—3.9207	—4.0016	— .0809
Russian	—4.1010	—3.9021	+ .1998
Pole	—4.4185	—4.1235	+ .2950
Greek	—4.6232	—4.1410	+ .4822
Armenian	—4.6824	—4.2425	+ .4399
Japanese	—4.9396	—4.0853	+ .8561
Mexican	—5.1018	—4.2776	+ .8242
Chinaman	—5.3055	—4.6005	+ .7050
Hindu	—5.3529	—4.5746	+ .7783
Turk	—5.8207	—5.2240	+ .5967
Negro	—5.8686	—5.0888	+ .7798



for the two groups. At the right is shown the size of the difference, a plus sign indicating that the particular nationality is rated higher on the Toronto scale than on the Chicago scale, a minus sign indicating the opposite situation.

The effect of the high percentage of students of American birth and parentage in the Chicago group is clearly indicated by "American" being 1.5570 points higher on the Chicago than on the Toronto scale. One might expect the difference to be even greater were it not for the broad similarity between the American and Canadian people, which results in "American" receiving a relatively high value on the Toronto scale.

The effect of the predominance of students of British birth and parentage is shown by the British nationalities, Englishman, Scotchman, and Irishman, being on the average .2740 points higher on the Toronto than on the Chicago scale. The corollary of this is the consistently lower values on the Toronto scale for the next group of nationalities, namely, Frenchman, German, Swede, South American, Italian, and Spaniard. These values are lower because the British nationalities are preferred to them more frequently by the Toronto group than by the Chicago group. The lower value for "Jew" on the Toronto scale probably results from the smaller percentage of Jewish students in the Toronto group.

The consistently higher values for the remaining nationalities are the result of the Toronto scale extending over a narrower range of values than the Chicago scale. This is indicated by the Chicago scale extending .7798 points beyond the limit of the Toronto scale and by the mean deviation for the Chicago scale being 1.23 as against 1.09 for the Toronto scale.

In this regard Thurstone suggests that: "Any measure of scatter of the scale values for the whole list can be used as a quantitative index of the tolerance of the group. When the scatter is wide the tolerance is low. When the scatter is small the group is correspondingly more tolerant."

This is indicated also by "Canadian" being chosen as the preferred nationality 97.7% of the times it is compared with another nationality by the Toronto group and "American" being chosen as the preferred nationality 98.1% of the times by the Chicago group.

There are three considerations which tend to support Thurstone's contention that this is an indication of greater tolerance in the Toronto group:

1. Canada, in addition to being a nation, is also a member of a broad commonwealth of nations. This would tend to reduce intense nationalism as such.
2. There is a smaller percentage of subjects of Canadian birth, namely, 85.9%, in the Toronto group than the percentage of subjects of American birth, namely, 94.1%, in the Chicago group. This would tend to increase the tolerance of the Toronto group.
3. The decided preference which the Toronto subjects show for British

nationalities may tend to produce less marked preferences between the remaining nationalities. As a result less distinction would be made among these nationalities with a resulting decrease in spread for this section of the scale.

In Figure 1 the scale values for the two groups are represented graphical-

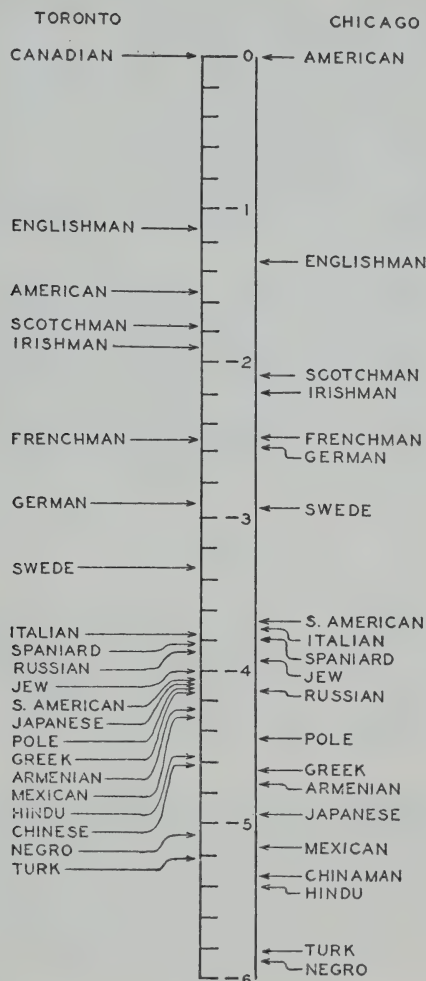


FIGURE 1

SCALE OF NATIONALITY PREFERENCES

ly. A comparison of the scale positions of the different nationalities for the two groups brings out some points of interest.

The higher relative position of Japanese on the Toronto scale is probably a true indication of a difference of attitude in the two groups towards the Japanese. Whereas Japan has been mentioned from time to time as constituting a military menace to the United States, she has been referred to as an ally of Great Britain about as frequently.

The higher relative position of Negro on the Toronto scale can be accepted as indicating a difference of attitude towards Negroes which is readily apparent to anyone familiar with the two cities.

The higher relative position of South American on the Chicago scale may result from Canadian students having less contact with South Americans than American students. Also Canada, being a member of the British Empire, does not exhibit as much interest in Pan-Americanism as is seen in the United States.

The evidence therefore indicates clearly that the method is sensitive to differences in nationality preferences which actually exist.

On the other hand, there is a marked similarity between the Canadian and American people, historically, culturally, and economically, which is bound to reflect itself in the attitudes of the two groups under consideration. As Thurstone maintains, this should produce a high degree of correlation between the two scales. This contention is supported in that the coefficient of correlation between the two scales is  $+0.98$ .

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A STUDY OF CHANGE IN INSTITUTIONAL ATTITUDES IN A  
RURAL COMMUNITY

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In a recent *Psychological Monograph* the writer (3) reported the results of several years' study of groups and institutions in a small rural community. In this study two types of attitudes were described: (1) personality attitudes and (2) institutionalized attitudes. Actual observation of human behavior indicated that many instances of human behavior conform to the normal curve of individual differences. When institutionalized, however, behavior seemed to yield a J-shaped, or perhaps highly asymmetrical, distribution.<sup>1</sup> This is particularly significant when institutions are defined, as they are in a certain recent school of social psychology, as common behaviors. Under such a definition one might expect a normal distribution of behavior with an unusually high mode. Atypicalities in such a case would extend equally in both directions. This, however, is not the case. The banking-up of common reactions in institutional behavior occurs at one extreme of a behavior continuum. The deviations are in one direction only. Institutional behavior would seem to be an occurrence which arises when some factor in the situation possesses a weighting which tends to skew what would ordinarily be a normal distribution. People, if allowed to drive their cars as they wished, would probably drive in positions relative to the middle of the road which would tend to form a normal distribution around the middle of the road. Governmental regulation, however, causes them to drive on the right side of the road in the majority of cases.

In the study mentioned no attempt was made to describe how institutional behaviors come into being—how, in the sense described, the normal distributions become skewed into asymmetrical distributions. During the period of observation of community life, however, many events which were observed seemed to indicate how such conditions could come about and how, after such attitudes were established, they might be perpetuated.

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<sup>1</sup>The hypothesis of the J-shaped distribution as a form of distribution characteristic of institutional behaviors was formulated by Floyd H. Allport and the writer as a result of the inspection of the writer's data. It has been corroborated in a recent study of traffic by Mr. Milton C. Dickens. A theoretical statement of the hypothesis in its relation to social problems and social psychology, based largely upon the findings of this study and the one of Mr. Dickens, is presented by Professor Allport in Chapter VII of *Psychology at Work*, edited by Paul S. Achilles (1). Further investigation of this hypothesis is now being carried on in industrial, political, religious, and economic fields.

## A. INSTITUTIONAL ATTITUDES IN THE MAKING

In the study of "Elm Hollow" community certain common attitudes toward location of a consolidated school were noted. These attitudes seemed possible of allocation in the following scale of attitudes:

1. The superiority of the Elm Hollow location over other sites is very great and there is almost nothing to be said for other locations.
2. The Elm Hollow location is superior in general, but there is much to be said for other locations.
3. The advantages of the Elm Hollow locations have equal merit with those of other locations.
4. Other locations are superior in general, but there is much to be said for the Elm Hollow location.
5. The superiority of other locations over the Elm Hollow location is very great and there is almost nothing to be said in favor of the Elm Hollow location.
6. No attitude.

A sample of the attitudes of the community on this question in the year 1928 is shown in Table 1.

TABLE 1  
ATTITUDE TOWARD THE CONSOLIDATED SCHOOL

	No.	%	
1. Elm Hollow only	12	14.63	xxxxx
2. Elm Hollow first	41	62.20	xxxxxxxxxxxxxxxxxxxxxxx
3. Both equal	15	18.29	xxxxxx
4. Other site first	1	1.22	x
5. Other site only	2	2.44	x
6. No attitude	1	1.22	x

It should be noted that the distribution secured is highly asymmetrical. The mode is on the second step. Now the chief rival of Elm Hollow for the school was "Green View." No study was attempted of attitudes in Green View community. The writer is of the opinion that, had such a checking been made, the distribution found would have resembled that of the Elm Hollow people in form. The mode, however, would have been on steps four or five. Students of attitudes have commented on the fact that political attitudes are seldom normally distributed. If the two communities had been studied the writer believes a bimodal distribution would have pictured two homogeneous communities.

It is interesting to analyze the distribution secured. First there were many neutral individuals, in fact 18%, who had no preference for one site above others. The investigator was convinced that only a small proportion of the community was vitally concerned with this question and most of these individuals were among those within the 14% on the extreme step. Studies have shown that extremists tend to hold their attitudes most vig-



orously. Of the 14% two or three individuals seemed most concerned about this matter. One of these individuals was the local druggist. A great deal of his book business came from the school children and he was concerned about a possible change of location. Another much-concerned individual was a former school-board member. He had resigned from the board after a quarrel with the superintendent. People claimed that his opposition was partially motivated by this quarrel inasmuch as school consolidation was a favorite project of the superintendent. Both of these individuals were fluent talkers and expressive personalities. Each had many friends in the village. The investigator was inclined to believe that had not these vigorous exponents of the Elm Hollow location been present in this situation many more individuals would have been found in the neutral column. Many people with no children, who could give little reason for their attitudes, were found among those favoring the Elm Hollow site. The writer believes (1) that a feeling of community loyalty caused many of these individuals to believe the way they thought most people in the community believed and (2) that biased individuals in the community who are given to expression of their opinion tend to create an illusion regarding community opinion that does not always correspond with the real facts. Those who do the talking in a community tend to be taken as community spokesmen.

That these conclusions were not too far fetched was strikingly illustrated at a later date. During the third year of this study an extraordinary event occurred. The Department of Education threatened to condemn the local school houses. This meant that if union were not accomplished a raise in taxes would follow. This brought everybody who paid taxes into a vital relationship to this problem. Instead of securing a favorable solution to this problem this new threat divided the two communities into armed camps. When Elm Hollow people were rechecked (in 1932) regarding this question the distribution shown in Table 2 was forthcoming.

TABLE 2  
ATTITUDE TOWARD CONSOLIDATED SCHOOL

	No.	%	
1. Elm Hollow only	63	76.83	xxxxxxxxxxxxxxxxxxxxxxxxxxxx
2. Elm Hollow first	13	15.85	xxxxx
3. Both equal	5	6.10	xxx
4. Other site first	0	0.00	---
5. Other site only	1	1.22	x

This type of attitude distribution has already been defined as institutionalized. The circumstances described perhaps indicate how institutionalized attitudes come into being. There have been those who believe that if a political issue could start without distorting elements attitudes concerning

it would be normally distributed. In real life it would seem that articulate vested interests are in the field before the public comes into a vital relationship with the problem. Propaganda which at the time may have little meaning to the individual has a later effect.

#### B. INSTITUTIONAL ATTITUDES, HOW THEY ARE DISCARDED

It became evident in the progress of the study that many people of the community were convinced that the community was no longer large enough to maintain two churches. Although the population had been decreasing for years the problem was brought to a critical state at this particular time because of two circumstances: The Methodists had been set a preacher whom they did not like. The Baptist preacher, a theological student, who was very much esteemed, was forced to move to another part of the state because his theological seminary had changed location. This meant that the Baptists would no longer be able to secure able student preachers. Both groups seemed to realize that their funds for preaching could no longer secure more than very mediocre ability.

In view of the friendly relationships among people of both creeds, for they met in many common enterprises, it seemed unusual that some basis for church union could not be found. Most people seemed to feel that such a union was desirable, but few seemed to believe it a possibility. The chief difficulty, so the investigator was often told, was the fundamental difference in the position of the two churches in regard to baptism. These positions were not to be reconciled.

During the study the investigator made a definite check of the attitudes of church members in regard to baptism. Although the two churches were supposed to be at sword's points regarding this question there seemed only a baker's dozen in both churches who really possessed strong opinions on the matter. Most people seemed unusually tolerant. In fact, a great many believed that baptism was simply a ceremony long retained with little meaning. Two conclusions might be reached from these data: (1) perhaps people's words do not correspond with their Sunday behavior, and (2) perhaps this difficulty is ideological and does not exist in reality.

Other happenings clarified this situation. Shortly after this time the writer was surprised to discover that his study of attitudes toward card playing seemed completely discredited by what people at card parties actually did. A group of Methodists and Baptists, most of whom had already avowed no opposition to bridge playing, were found at community card parties playing a game of their own in a corner of the room. Consequently, this question was reopened. It was discovered that two attitudes existed in regard to card playing. One attitude has been called a "public attitude" and the second a "private attitude." Different techniques of in-

terviewing seemed responsible for the particular attitude secured.<sup>2</sup> The distribution of attitudes of Baptists on card playing is seen in Table 3.

TABLE 3  
ATTITUDE TOWARD CARD PLAYING

	Public attitude		Private attitude	
	No.	%	No.	%
1. No cards	—	—	—	—
2. No face cards	46	90.20	10	19.61
3. No gambling but no harm in other card games	2	3.92	37	72.55
4. Any kind of card games	3	5.88	4	7.84

The same individuals were reinterviewed in regard to baptism and both public and private attitudes were found on this issue also. The distribution is shown in Table 4.

TABLE 4  
ATTITUDE TOWARD BAPTISM

	Public attitude		Private attitude	
	No.	%	No.	%
1. Favor sprinkling	46	90.20	8	15.69
2. Either form of baptism	4	7.84	36	70.59
3. Favor immersion	—	—	3	5.88
4. No attitude	1	1.96	4	7.84

It is evident that the question of baptism was not simply an ideological controversy. In certain public situations there is a real difference between Methodists and Baptists. Very little is known regarding just how these dual attitudes came into being. Considerable evidence was seen as to why they continue to exist.

During the second year of residence in the community the investigator became intimately acquainted with the local Baptist preacher. It was surprising to discover that the pulpit life of this individual presented a picture very contradictory to his personal beliefs. In most of his private beliefs he was liberally inclined. The community, however, judged him to be a Fundamentalist.

This condition of affairs seemed quite unusual when the rest of the personality of the preacher was considered. On most things he is con-

<sup>2</sup>The whole problem of the technique of interview and its effect on attitudes secured is discussed in the monograph noted.

sidered too outspoken. It seemed unusual to find him silent, then, on many items that seemed very vital. When questioned he willingly revealed his position. In fact, the opportunity to talk with one not connected with the community seemed to allow the release of considerable pent-up emotion. He bitterly resented small towns. He felt the people were quite unappreciative of his abilities. However, the position provided the funds with which to finish school. His chief income was from church contributions and the chief church contribution came from Mrs. Salt. He felt it completely inexpedient to come into conflict with her fundamentalist religious beliefs. He cared very little for the opinion of other people in the community.

One might believe that Mrs. Salt was the person mainly responsible for these attitudes about cards and baptism. If this is so, no one in the community recognized the fact. There was a common feeling in the community that most people were loyal to the church's stand of opposition to playing bridge. It was also felt that the greater majority of each church group were adherents to the particular form of baptism espoused by their group. It would seem that people are not generally aware of the private sentiments of their neighbors.

The investigator was absent from the community during a period of two months. Upon his return he learned that Mrs. Salt had passed away. Things, however, went on much the same as before her death. At the next card party the same people of the two churches were playing rook and flinch. The idea suggested itself that if Mrs. Salt was the dominant factor behind this holding of dual attitudes then such a condition was no longer necessary. Inasmuch as the preacher had stated very liberal opinions about cards the investigator invited him to the next card party. Both he and his wife came and played bridge.

The aftermath of this party was one of the most interesting experiences of the study. The high conflict which existed in people's minds regarding cards was revealed in the gossip that followed. The subject furnished back-fence conversation for days. The majority of people expressed amazement at the occurrence. The results were striking. The investigator insisted to all that questioned him that the preacher was a real liberal and that no one had ever invited him before. He stressed the belief that he was also unconcerned about baptism. People who favored church union sounded him out and found him sympathetic. A meeting was called for the purpose of approaching the Methodists.

It seems probable that there is a stage in attitude change when attitudes are maintained in a group because of illusions regarding how universally the attitude is held by other members. This state is one which F. H. Allport has referred to as a condition of "pluralistic ignorance" (2, p. 273 and footnote 2). When the ignorance is dissolved the attitude is given up. Such a condition was probably the basis for the entertaining of those at-



titudes which we have called "public" as over against the private or personal attitudes. That is to say, since no systematic canvass had been made by any individual concerning his fellow citizens, a certain conservative attitude having a respectable connotation was assumed by each to be the representative attitude of all. The conditions that make pluralistic ignorance possible are probably many. On the questions at hand there was really little opportunity for checking the neighbors' attitudes. Vested interests maintain propaganda that favors the illusions. Other subtle influences are no doubt at work. It would seem probable that in the economic field objective checking on neighbors' behavior would be easier than in the field of religion.<sup>3</sup>

#### SUMMARY

The events narrated seem to indicate that vested interests have considerable to do with the way in which institutional habits are formed. It was evident, however, that when the institutional attitude was finally established it was built upon a need among all concerned. It might be possible, on the other hand, if the vested interests were absent, to satisfy the need through a different course of action than the one adopted under pressure of propaganda.

Institutional attitudes may be maintained in individuals long after the need for their maintenance is reduced only to an illusion of universality of the attitude among group members. This is called a condition of pluralistic ignorance. When members are provided an objective criterion of other people's attitude the institutional attitude is likely to be discarded. It seems probable that the opportunity for encountering such objective

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<sup>3</sup>EDITORIAL NOTE: It is worth suggesting that the holding of a "public" attitude built upon a condition of pluralistic ignorance probably has a still further significance. For example, it is possible that subjects entertain not only a "public" belief, based upon pluralistic ignorance rather than a knowledge of facts, and dealing with the church ideology of baptism, but also a belief in an institution (the Baptist Church or the Methodist Church) as a thing in itself, embodying attitudes and prescriptions which are binding upon individuals. This is not a deep logical conviction, of course, and its holder might reject it if led by questioning to a critical examination. Nevertheless, he seems, in the absence of questioning, to act upon it as a kind of unanalyzed, semi-emotional assumption. On the one hand, this making an entity of an institution as the source or author of an opinion is one of the results of the condition of pluralistic ignorance. Since we do not know who, specifically, stands for the "public" attitude which we ourselves have endorsed we project a super-individual institution, or a community, to which the attitude is supposed to belong. And, on the other hand, it is this projected super-individual-group concept which seems to give us the justification for our own acceptance and endorsement of the "public" attitude.—Floyd H. Allport



criteria is much less frequent in the field of religion than, say, the field of economics.

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## EXAMINATIONS IN FAMILIAR AND UNFAMILIAR SURROUNDINGS

PAUL R. FARNSWORTH

Smith and Guthrie (1, pp. 112-113) report a series of studies by W. R. Wilson on the facilitating action of familiar surroundings. Ten subjects learned lists of nonsense syllables and "72 hours later relearned the same lists sometimes in the same surroundings, and sometimes in different surroundings . . . . In eight of the ten subjects there was greater saving in each case where relearning occurred in the same surroundings in which the first learning had taken place." Year after year these results have seemed to impress the writer's students. A discussion of them almost invariably has led to the question: "Will it harm our grades if we take our final examination in a room in which our class has not been customarily held?" In an attempt to answer this query the following experiments were undertaken.

The set-up was identical for the four classes studied. From each class were selected two groups of students who were paired as to intelligence test score (Thorndike) and class grade average (up to the final examination). That is, each subject was paired with another who had either an identical Thorndike or one which differed by only two points at a maximum. Similarly, the paired control differed in class average by not more than two points.<sup>1</sup> This maximum variation of two points was an arbitrary matter. Such strict pairing was decided upon to bring out most strongly whatever effect might be present. As a result, only a fraction of the members of

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<sup>1</sup>The mean Thorndike and class grades of the paired groups were always practically identical.

each class could be employed in the pairings. The experimental procedure, of course, was to keep one group in the regular classroom on the day of final examinations, and to take the second to an unfamiliar room. Comparisons were later made of the two examination means in each instance, and the formula for  $D/\sigma_D$  (in which note is taken of possible correlated variables) was employed.

The results clearly show that if there is a factor associated with the unfamiliarity of the surroundings it is so minute that it is obscured by the general unreliability and invalidity of grades. In a class of slightly over 200 in elementary psychology two groups of 59 each were chosen for the comparisons.<sup>2</sup> The students who remained in the familiar classroom scored slightly better in the final examination. However, the  $D/\sigma_D$  was only .54. In another smaller class in elementary psychology in which two groups of 19 each were paired, the students in the unfamiliar setting received the higher examination grades. This meant as little as before as the  $D/\sigma_D$  was .45. The members of a class in social psychology served in the third experiment. Seventeen pairs were chosen. Although those who remained in the familiar surroundings received slightly higher examination grades,  $D/\sigma_D$  was a mere .84. Even closer were the grades of 18 pairs of subjects from a class in abnormal psychology as was shown by the  $D/\sigma_D$  of .03.

As a result of the collection of the above data it can safely be stated that, although in certain situations the unfamiliarity of the surroundings may react adversely on relearning, no ill effect was shown to be operative on memory when examinations were taken in rooms in which the classes had not customarily been held.

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#### THE RELATION OF THE MORPHOLOGICAL INDEX AND SKIN RESISTANCE TO COMPLEX PSYCHOLOGICAL TRAITS

EDWIN G. FLEMMING

Studies in abnormal psychology indicate the existence of a relationship between morphology and temperament (3, 4). The basis for such a relationship seems to be the operation and influence of the endocrines, since it has been well established that the ductless glands affect growth, differentiation, intelligence, and temperament. Naccarati and Garrett say (4):

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<sup>2</sup>In no instance did the subjects know the nature of the experiment.

" . . . if the endocrines affect both the morphology and the mental and emotional life, then certainly the morphology should serve as one index of less easily measured mental and temperamental traits." These investigators have found a small but positive relation between morphology and intelligence, and a positive relation between the morphological index and emotional stability. Garrett and Kellogg (3), however, found no relation between the height/weight ratio, a measure equivalent to the morphological index, and measures of general intelligence, social intelligence, and emotional stability.

Since there does seem to be some logical ground for a relationship between morphology and temperament, supported at least by evidence from the field of abnormal psychology, this study sought to determine whether such a relationship exists among normal girls with respect to complex psychological traits other than intelligence.

A second aspect of this investigation is the possible relation between complex psychological traits and the resistance of the skin to the passage of an electrical current. A possible connection is based upon the same line of argument as in the case of the possible relation between morphology and temperament. The psychogalvanic reflex which is superimposed upon the initial resistance of the skin to the passage of an electrical current is fairly well demonstrated to be a function of the operation of the sweat glands, and the initial resistance is also probably related to these glands. The functioning of the sweat glands is influenced by the endocrines, which in turn affect both morphology and temperament.

Further, a definite impetus to this aspect of the investigation was given by a preliminary, exploratory study made by the author in 1927 (2), when with a group of 18 subjects he found a correlation of .44 between skin resistance and magnetic personality, and a correlation of .40 between skin resistance and nervous temperament.

The "morphological index" used in this inquiry was the height of the subject divided by her weight, which measures were secured from the office of the physician of the school. Both these measurements are of the nude. The height/weight ratio is essentially the equivalent of the morphological index, figured more accurately from more complicated measurements as indicated by correlations between the two of .70, .75, and .81 (3).

The resistance of the skin to the passage of an electrical current has been indicated by a number of investigators as unreliable (1, 5), since it changes from subject to subject, from time to time during the day with the same subject, and also from day to day. The figures given by these investigators indicate that there is unquestionably change in resistance from time to time.

In this inquiry the resistance was measured by means of a simple Wheatstone bridge and galvanometer. The terminals were two glasses of con-

centrated salt solution into which the subjects dipped the first and second fingers of the right hand up to the first joint. To insure the proper depth of immersion rubber cots were placed upon the fingers protecting the skin back of the first joint. All resistances were taken in the morning from nine o'clock to noon. While the resistance of any given subject is known to increase from morning to noon, which fact would be likely to obscure our results to some extent, it is unlikely that this is a great source of error since the correlation between resistance and the time that the resistance was measured is only .14. It would, however, undoubtedly be more desirable to take all the resistances at the same time of day.

To check on the reliability, the resistance was measured a second time on a later day at approximately the same time as on the first day. The coefficient of reliability was found to be .70. There is change in resistance from day to day even at the same hour, but the change is relatively slight in most cases when compared with the total range of resistances shown by the entire group. With resistances ranging from 19,000 to 75,000 ohms a change of 3000 or 4000 ohms is of relatively little significance. The reliability of the measure is then sufficient for its use in an exploratory, scientific study.

The subjects were the last two classes of girls of the senior high school in The Horace Mann School, Teachers College. There were 88 girls altogether, but due to incomplete data in some cases the correlations are based upon 62 cases.

The traits with which the height/weight ratio and resistance were correlated are given in Table 1, together with the correlations found.

The traits indicated in the table were measured by means of rating scales. The ratings were secured on the basis of a linguistic scale rather than a

TABLE 1

SHOWING THE CORRELATIONS BETWEEN HEIGHT/WEIGHT RATIO AND BETWEEN RESISTANCE AND THE TRAITS INDICATED

	Height	
	Weight	Resistance
Intellectual enthusiasm	— .09	.26
Capacity for independent thinking	— .04	.29
Capacity for independent work	— .04	.17
Industriousness	— .07	.11
Social adaptability	— .20	.16
Executive ability	— .19	.10
Dependability	— .02	.14
Self-control	— .13	.17
Good manners	— .10	.19



numerical scale. For example, in rating "intellectual enthusiasm" the descriptive words were *zealous, eager, steady, roused at times, passive*. Suitable terminology was used for the other traits. In some cases there were four steps, while in others there were five or six. In transposing the linguistic ratings into numerical scores for the purpose of correlation, the best characterization was given a value of five and each step down the scale a value of one less.

The judges were all of the teachers that the pupils had over a period of three years. The ratings were secured from the teachers at the end of each school year. In no case were there fewer than seven ratings on any trait, while in some cases there were as many as twenty-two judgments. The average rating for the three years was taken as the measure on the trait.

The correlations found indicate no significant simple relationships with the height/weight ratio. Although they are all negative, no particular significance can be attached to that fact because they are all so low. However, if repeated inquiry reveals always negative relationships with presumably desirable characteristics, then we might be warranted in concluding that macrosplachny seems to be slightly associated with such traits.

The correlations, however, of  $-.19$  and  $-.20$ , while low, are still high enough to make us pause for further questioning. It so happens that age in this particular group of girls is negatively associated with each of the characteristics used in this study. Age also correlates negatively with the height/weight ratio. If, then, we partial out age we get a correlation of  $.25$  between the height/weight ratio and executive ability; and a correlation of  $.27$  with social adaptability, which was defined as the ability to cooperate with others in group activities.

It does appear, then, that there is at least a slight tendency for macrosplachny to be associated with executive ability and social adaptability or cooperation. In other words, those tending to rank high in weight as compared to height are inclined to be somewhat more sociable and to possess somewhat greater ability to handle others.

Now, we may ask, why should such a tendency be manifested? Why should those who are somewhat heavier in relation to their height seem to be more socially adaptable and tend to possess somewhat more executive ability? It is possible that those who enjoy better general health, having better appetites, consume more food and so tend toward macrosplachny. Better general health may include sounder emotional health, better emotional control, and a greater willingness to give as well as take, and a more objective attitude toward social problems.

It may be that those who are subject to emotional tensions, which, according to the authorities, are energy-consuming, do not have the reserves indicated in comparatively greater weight. Conversely, those relatively



free from emotional tensions, feelings of inadequacy, and so on do not use as much energy as others, and so have been able to build up a reserve reflected in a tendency toward macrosplanchny.

Again it is possible that the macrosplanchnic have a slightly less active thyroid gland, which permits the accumulation of reserves. The slight hypothyroid condition may also be reflected in a lessened tendency toward "nervousness" and irritability which permits more agreeable social adjustments and participation, and consequently leads to a somewhat greater reliance by others upon those individuals as leaders in executive positions.

It is likewise possible that the mere appearance of greater solidity of the macrosplanchnic may breed a tendency toward confidence on the part of others, which in turn leads to successful and agreeable social participation and more opportunities to display such ability to lead as the individual may possess.

However, it is impossible to know upon the basis of our present information whether any or all or none of these factors contribute to the apparent relationship. Furthermore, correlations of .25 and .27 with but 62 subjects are so slight that any conclusion must be but tentative, even though we may consider them sufficiently high to warrant further inquiry.

The correlations between resistance and the traits measured are all positive. The correlations of .26 with intellectual enthusiasm and of .29 with capacity for independent thinking indicate a tendency toward association. Certainly one would not say that the higher resistance causes the intellectual enthusiasm or the capacity for independent thinking.

When age is held constant the correlation with intellectual enthusiasm becomes .30, and that with capacity for independent thinking becomes .34. The P.E. of these correlations with 62 cases is about .08, so that the chances are that the relationship is positive.

A possible explanation of such a relationship may be found in the findings of Wechsler (5) who indicates that while physical activity reduces the resistance, intellectual activity increases resistance. It may be that an individual who is judged by his teachers to show more rather than less intellectual enthusiasm actually does more mental work, which, from Wechsler's findings, we would expect to be reflected in a higher resistance of the skin. Likewise, an individual who is judged by his teachers to be capable of independent thinking probably actually does more thinking than the others, and consequently such greater mental activity shows itself in an increase in the resistance of the skin. This explanation may be tenable because the correlation reveals just a tendency.

## CONCLUSIONS

The height divided by the weight, as a relative equivalent of the morphological index, appears to be negatively associated with social adaptability and executive ability when age is held constant, as indicated by partial correlations of  $-.27$  and  $-.25$ .

The resistance of the skin to the passage of an electrical current is fairly reliable as indicated by a coefficient of reliability of  $.70$ .

The resistance of the skin appears to be positively associated with intellectual enthusiasm and with capacity for independent thinking, as indicated by simple correlations of  $.26$  and  $.29$ . When age is held constant the correlations are increased to  $.30$  with intellectual enthusiasm and to  $.34$  with capacity for independent thinking.

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## VOLUNTARY SIMULATION OF ALLERGIC SNEEZING

LAWRENCE GAHAGAN

"In the ordinary neuroses one always finds on close inspection an advantage from the disease" (1, p. 497).

This report summarizes the case of a young woman, who from the age of five to fourteen years voluntarily employed the habit of sneezing in order to obtain immediate ends, and in whom still persists (now at nineteen years of age) a residual effect of non-voluntary sneezing, which appears whenever the subject is angry or fatigued. It is well known that sneezing is a congenital reflex, i.e., present at birth,<sup>1</sup> and in the human characteristically

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<sup>1</sup>Watson (2, p. 118) reports that sneezing may appear in the infant even before the birth-cry.

remains little, if at all, influenced by habit formation (2, p. 118). In this case, however, voluntary sneezing appearing in childhood resulted in an intermediate condition between normal and neurotic behavior. The habit of voluntary sneezing finally disappeared when it no longer possessed an advantage.

The subject is of superior intelligence (Otis  $IQ = 120$ ), with some evident traits of neuroticism, notably, a readiness to blush and occasional faintness. However, her Thurstone Personality Schedule score (Clark Revision) is 28, which indicates a degree of neuroticism less than the median for women, and just at the median for both sexes. The Thurstone score is in agreement with the fact that she is now socially well adapted.

At five years of age, the subject suffered attacks of nasal congestion and sneezing, and was found by means of positive skin reactions to be hypersensitive to pineapples, strawberries, and grapefruit, indicating food allergy, and to golden rods and asters, indicating pollen allergy. Medical treatment was begun immediately and her sensitiveness to these substances was greatly reduced and so remains. In the early medical examinations she comprehended that certain substances in the environment caused sneezing, and soon thereafter would voluntarily sneeze in order to avoid eating things she did not like, particularly chicken and eggs. Her initial success with use of voluntary sneezing produced a spread of the habit until it became a dominant means of defense, of obtaining attention and sympathy, and of emotional expression. Some examples are given. At six years she exploited voluntary sneezing to avoid piano lessons. She also found that she could turn the attention of family friends from her younger sister to herself by a simulated attack of sneezing. At twelve years she entered high school, and it became necessary to study at night. This she avoided by voluntary sneezing. At this age she discovered that non-voluntary sneezing appeared whenever she became angry or very tired. At fourteen years she was sent away to boarding school, at which the teachers systematically ignored her sneezing. The habit no longer possessing an advantage, voluntary sneezing disappeared after a short time. The residual non-voluntary sneezing remains. This case clearly represents a *flight into disease*, in the sense as described by Bleuler (1, pp. 495-497).

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SCOTTISH COUNCIL FOR RESEARCH IN EDUCATION. *The Intelligence of Scottish Children; a National Survey of an Age Group*. London: University of London Press, 1933. Pp. x+160. 5/—.

This is a report of the most general results from the application, on June 1, 1932, of a one-hour group intelligence test to all children in Scotland born during 1921 (about 87,000); this was supplemented by the use of the Stanford-Binet with 1000 children chosen at random during the ensuing summer.

The outstanding results may be stated simply: The average IQ of the boys is almost precisely 100; that for the girls is probably in the neighborhood of a point lower, though the authors with commendable chivalry would evidently like to avoid this conclusion if it can reasonably be done; the standard deviation of IQ's is about 17 for the boys and 16 for the girls, figures which are substantially higher than had been anticipated; regular growth through the twelve months is clearly demonstrated (about .7 of a score point per month, which will no doubt be transmuted presently into IQ points); all the raw distributions are markedly skewed, with a massing of frequencies toward the lower end of the scale.

Concerning the enormous technical difficulties and their successful solution there is no need to enlarge here, beyond a word of admiration for the remarkable degree of cooperation among all concerned, from the Council which planned to the teachers who actually administered the tests; it is due to this cause mainly that it was possible for the first time in history to assess a virtually complete sample, including private-school pupils and the ineducable. The significance of this achievement is very great, even though there seems little to say of the results themselves beyond mentioning them; they are in the nature of foundation stones—vastly more important foundation stones than ever before elaborated, in that it is conceivable that they may be the units of some kind of ultimate structure. For example, the exact repetition of the experiment in ten years would yield the first direct quantitative data concerning a national trend ever to be placed at the service of social engineers; analysis by regions should yield important information on internal inequalities and their determinants; and it is incredible that the fact that it has been done for one nation and the techniques elaborated in doing it will not lead presently to parallel experiments by other nations. A kind of milestone has been passed in man's endeavors to learn something definite about himself.

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NORMAN L. MUNN. *An Introduction to Animal Psychology: the Behavior of the Rat*. Boston: Houghton Mifflin, 1933. Pp. 439.

The main title of this little volume is somewhat misleading since it suggests a general survey of the animal field, whereas the present treatment is limited in scope to the rat. In apologizing for this rather pretentious title, the author goes so far as to say that "the present treatise demonstrates that it is possible to write an essentially complete outline of animal behavior without going beyond the available data on the rat." Such a statement would seem to imply that the rat is the measure of all animals. In any case, it is likely to be resented by those of us who have striven earnestly to be not mere rat psychologists but animal, or comparative, psychologists. As a monograph on the behavior of the rat, the volume has much to commend it. It is reasonably complete, conveniently arranged, and well illustrated. The vast amount of experimental work done on the rat during the past several decades would seem to justify a compilation of this sort. There are numerous other species and groups which deserve a similar separate treatment. It is to be hoped that these will not be overlooked in our passing frenzy for the white rat.

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# THE J-CURVE HYPOTHESIS OF CONFORMING BEHAVIOR<sup>1</sup>

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FLOYD H. ALLPORT

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## I. DISTRIBUTION ON A TELIC CONTINUUM: THE J-CURVE HYPOTHESIS

Franklin H. Giddings once made a statement to the effect that, if we could sufficiently reduce the prevailing temperature, we would find practically everyone going about with his coat collar turned up about his ears. This remark of the founder of "pluralistic behavior" contains not only a profound truth, but a vital suggestion for research. It points out a field of objective phenomena which can be agreed upon, isolated, and measured. All that is needed is that we ask further questions which are suggested by the statement quoted. First, what is the degree of temperature at which this universally similar behavior will occur, and what determines it at that point? Secondly, will *all* the people respond by turning up their collars? If not, what proportion will so respond? And what about those who do *not*? Will they do other, and perhaps lesser, acts toward the end of keeping warm? If so, what actions, and what proportions will perform these acts respectively?

Not only Giddings, but other social students, have regarded their field as dealing properly with social norms or modes of agreement. Their work has consisted in discovering, defining, and describing such modal points of conformity as the content of a generally accepted attitude, a folkway, a custom, a tradition, a convention, or an institution, or such societal tendencies as "public opinion," mass action, imitation, social forces, pressures, and culture patterns. Social solidarities are also presupposed in various forms of human

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<sup>1</sup>The writer acknowledges with thanks the valuable assistance of Miss Eleanor Lathers in the statistical preparation of this paper. The kind help of Mr. Arnold Doxsee in drawing the graphs is also acknowledged. In particular, the writer wishes to thank those students and colleagues who have contributed observations which are reported in the following pages. He also expresses his grateful appreciation to Dr. William E. Mosher, Director of the School of Citizenship and Public Affairs, for financial aid in preparing this paper for publication.

engineering, from nationalistic movements to working-class propaganda and organized charity. This emphasis upon uniformity, though legitimate for certain purposes, is inadequate for a statement of society in terms of human action. We want to know not only the abstract mode, or position of conformity, but the entire "lay" or distribution of human behavior upon the act in question and the factors contributing to that distribution. Until we know this, we shall never know the relevance of the conventional pattern to individual needs; nor can we predict either the need or the likelihood of change.

A few years ago, Dr. Richard Schanck was applying certain scales for measuring the attitudes of people in a rural community (near Syracuse, New York) toward symbols representing their town, their associations, and their institutions.<sup>2</sup> He expected that he would find the usual bell-shaped, normal probability distribution of these attitudes, and hence could readily use their median as an index of measurement for the community. To his surprise, however, many of his distributions were skewed far to one side, some of them so completely as to be one-sided in slope. The mean or median of a distribution of this sort did not seem to possess so much significance as the fact that the distribution was one-sided and steep at a particular point. There was consequently much difficulty in trying to find a way to describe his data in the conventional, statistical terms. It then occurred to the present writer that this might be the very nature of the distribution of those behaviors which make up social customs and institutions; in other words, that conforming behavior is something to be described not so much in terms of a norm or index, as in terms of an entire distribution. Since that time the writer has been testing and developing this hypothesis in studies at Syracuse University. Further data have been added by a number of students and colleagues. Dr. Schanck and Mr. Milton Dickens, in particular, have made valuable contributions. The purpose of this paper is to assemble the data now on hand and to attempt a precise statement of the hypothesis involved.

To understand the basis upon which our data have been collected, it is necessary to think of a series of units, or positions, along what we may call a *telic continuum*. This is a continuum of purpose.

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<sup>2</sup>Dr. Schanck, at that time a graduate student, was working upon this problem under the guidance of the present writer.

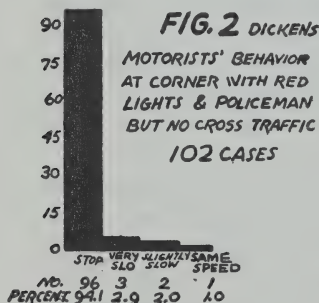
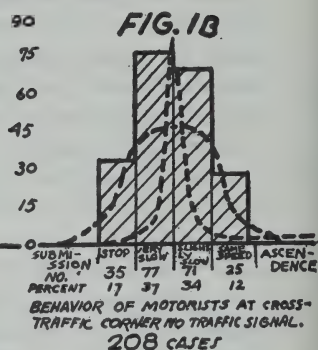
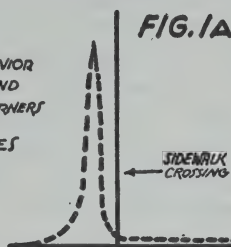
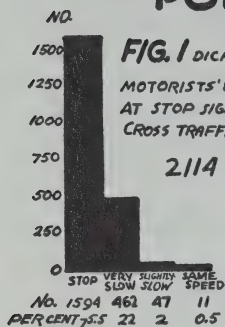
It deals with the question of "how much of" (or how fully) a certain purposive, meaningful, prescribed act is carried out in practice. Such a continuum is also concerned with the objective to be gained by the concerted action of many individuals, an objective commonly recognized, and one toward which we may expect a fair degree of conformity in action. For example, we have employed a continuum dealing with the degree of obedience to traffic signals, such as boulevard stop signs, red lights, etc. The underlying purpose of such signals and regulations, in the minds both of those who made them and those who obey them, is the securing of safety while driving in traffic. The question of to what extent, or how well, one obeys the traffic rule can be determined only by interpreting what one actually does in the traffic situation in terms of how fully that act fulfills this underlying purpose. The positions<sup>3</sup> on our continuum represent recognizable degrees in which this purpose is fulfilled by respective degrees of performance of the prescribed act. Thus *stopping completely* before the crossing at the appearance of the red light would be the maximum degree of fulfillment. All who stop at the red light lie in this first position of maximum satisfaction of the purpose of traffic safety through complete obedience to the rule. The next recognized degree is *slowing down considerably*, but not stopping, before the red light. This act represents a smaller degree of fulfillment of the purpose through a lesser degree of obedience to the regulation. *Slowing down only slightly* is our third scale position. It represents a still smaller degree of obedience and fulfillment. The fourth and last position is *going ahead without change of speed*, an act which represents an entire disregard of the signal and no fulfillment whatsoever of the common purpose of safety in motor traffic.<sup>4</sup> These four degrees of speed of motorists at red-light crossings have been found to be

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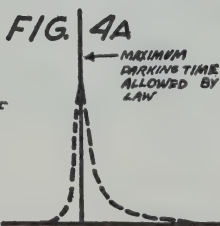
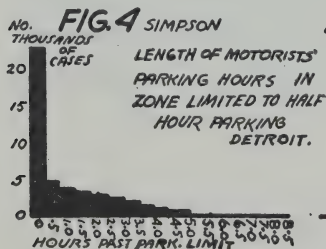
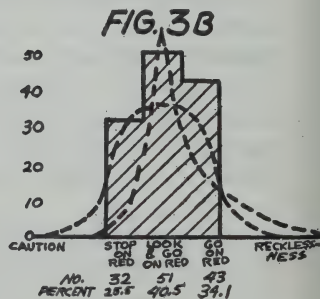
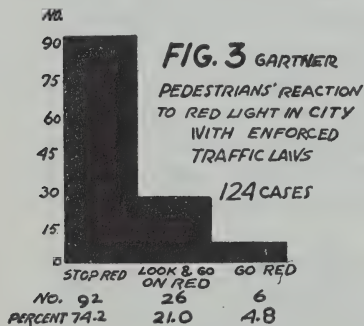
<sup>3</sup>The term "position" is more accurate in this connection than the term "step," since the latter represents an interval whose equality with the other intervals to the right and left has been established by physical or psychophysical techniques. While such equality has been secured in some of our continua, it cannot be regarded as established in the present instance. For the same reason it is probably better in the present case to speak of a "continuum" rather than a "scale."

<sup>4</sup>Representing no degree of fulfillment, it should perhaps be omitted from the continuum, since our continuum properly contains only recognizable degrees of *fulfillment*. We have, however, included it for empirical purposes.

# POLITICAL (TRAFFIC)



- GARTNER -  
REACTION OF PEDESTRIANS  
TO RED LIGHT WITHOUT  
ENFORCEMENT  
126 CASES



**FIG. 4B**

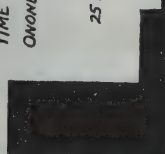


FIG. 5 DICKENS

TIME CLOCK RECORDS  
ONONDAGA POTTERY CO.

1277 CASES

25 INDIVIDUALS - DAY WORK

NO. CASES  
1250

NO. CASES 1087  
PERCENT 85.1

ON TIME 1087  
FIRST 1/2 HR LATE 163  
SECOND 1/2 HR LATE 21  
THIRD 1/2 HR LATE 6

FIG. 6 DICKENS

TIME CLOCK RECORDS  
ONONDAGA POTTERY CO.

2545 CASES

50 INDIVIDUALS - PIECE WORK

NO. CASES



NO. CASES 2001  
PERCENT 78.6

ON TIME 2001  
FIRST 1/2 HR LATE 381  
SECOND 1/2 HR LATE 59  
THIRD 1/2 HR LATE 5

FIG. 7 LOEB

C.W.A. REGISTRATION  
SYRACUSE

271 CASES

NO. CASES



NO. CASES 187  
PERCENT 69

VERY PROMPT 187  
PROMPT 56  
MODERATELY PROMPT 21  
SLIGHTLY DELAYED 7

FIG. 5A

'ECONOMIC' TIME  
FOR LUNCH  
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FIG. 6A

'FACTORY RULES'  
TIME FOR START-  
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LUNCHTIME OF  
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START-ING WORKTIME OF  
CLOSING

FIG. 7A

TIME OF  
ANNOUNCEMENT  
THAT EMPLOYEES  
MUST REGISTER  
WITH C.W.A.TIME OF  
ANNOUNCEMENT  
THAT EMPLOYEES  
MUST REGISTER  
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THAT EMPLOYEES  
MUST REGISTER  
WITH C.W.A.

FIG. 5B

PUNCTUALITY

PUNCTUALITY

PUNCTUALITY

PUNCTUALITY

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FIG. 6B

PUNCTUALITY

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FIG. 7B

PUNCTUALITY

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## RELIGIOUS (CON'T)

FIG. 11 SEMPLE

STUDY OF AGGREGATE SING  
ING IN CHURCH NEAR AUBURN NY.

54 CASES

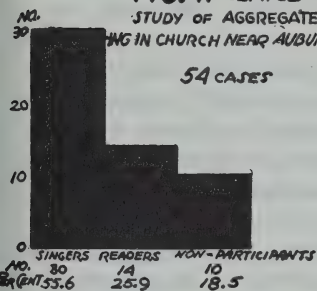


FIG. 11B

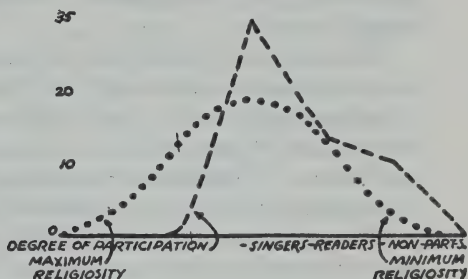


FIG. 12

E. LATHERS

TIMES OF ARRIVAL AT  
UNIVERSITY M.E. CHURCH  
SYRACUSE

223 CASES OBSERVED

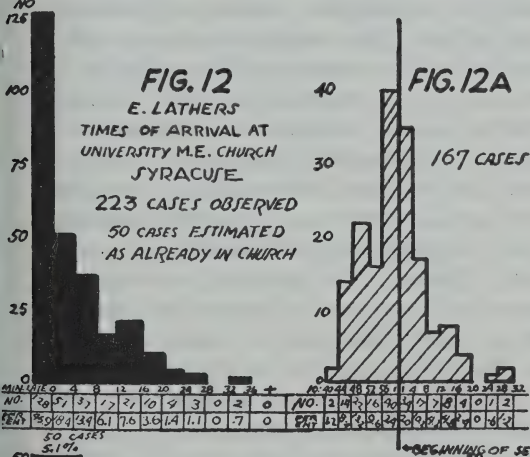
50 CASES ESTIMATED  
AS ALREADY IN CHURCH

FIG. 12A

167 CASES

FIG. 12B

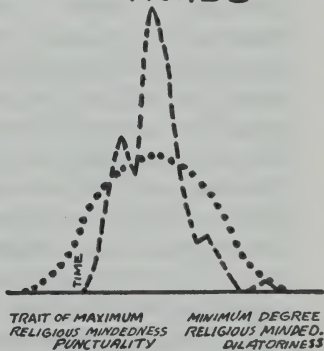


FIG. 13

KATZ AND ALLPORT

BELIEF OF CATHOLIC  
MEN IN THE DEITY.SYRACUSE UNIVERSITY  
1926

98 CASES

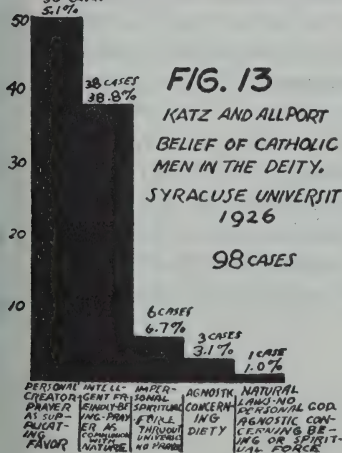
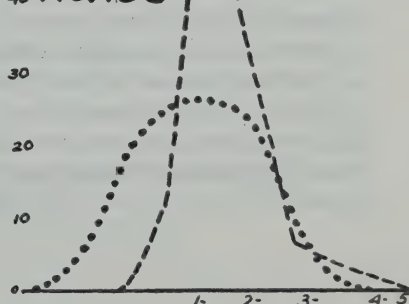


FIG. 13B



readily distinguished and recorded; and their accuracy of discrimination has been checked by chronometric methods. Our telic continuum, it will be seen, is one of *the amount of fulfillment of the purpose of the common or prescribed act*; and the points on the continuum are recognizable classifications of the fulfillment, arranged in order.

The data with which we are now concerned are shown in connection with the left-hand, solid black figures on each page of the accompanying charts. The heights of the black columns indicate the number of cases falling upon the different positions of the telic continuum. Throughout the charts, solid as well as shaded figures indicate the distribution of observations actually made.

Figure 1, from the work of Milton Dickens, shows the distribution of motorists on the continuum just described. The number of cases is 2114. The conditions involve the reaction to boulevard stop signs rather than red lights. The reactions were also taken only in cases where there was traffic coming at right angles to the direction of travel of the motorists concerned; so that a double incentive to stop was presented in the possibility of a collision and the presence of the stop sign. The data were gathered in two large cities. It will be seen that on the first position, that of complete stop, there were 1594 cases, or 75.5 per cent, of the entire number. On the second position, that of proceeding very slowly, there were 462 cases, or 22 per cent. On the third position, slowing only slightly, there were 47 cases, or 2 per cent. On the final position, proceeding without change of speed, there were 11 cases, or .5 per cent. The distribution is thus steepest on the position representing most complete obedience and fulfillment of the purpose of traffic safety, and decreases steadily to the position representing the least fulfillment recognizable, or no fulfillment at all. It is further to be noted that the decrease is less with each succeeding interval. The curve which is here hypothetically suggested, if one follows it upward from its lower extremity on the  $x$  axis, is one of *positive acceleration*. It may be compared roughly with a reversed letter J (without the tail of the J being turned up).

Figure 2 (also from Dickens) is compiled from the behavior of 102 motorists at a busy intersection in Syracuse, New York. The stimulating circumstances were both red signal lights and a policeman; but there was no cross traffic. Cars immediately behind other



cars, that is, those whose drivers had no choice but to stop, are not included. Here we see the same tendencies, but in more marked degree. Ninety-four per cent stopped completely, 3 per cent proceeded very slowly, 2 per cent slowed slightly, and 1 per cent went ahead without change of speed. The reverse-J-distribution, with the maximum number of cases on the position of complete fulfillment and the minimum on that of no fulfillment, is suggested.

Figure 3 (from data recorded by Miss Miriam Gartner) shows the distribution of the behavior of 124 pedestrians when confronted by red lights at street crossings in a city where laws governing the response of pedestrians to signal lights were in force. Here the continuum has three indicated positions: completely stopping and waiting before the red light, looking to right and left and then proceeding against the light, and going ahead without looking. The distributions on these positions are 92, 26, and 6 cases, respectively. These results conform in general pattern with the distributions pictured above; but there is an insufficient number of positions to test the J-curve theory adequately.

Figure 4 (reproduced by courtesy of Mr. Hawley S. Simpson)<sup>5</sup> indicates the lengths of time cars were left parked in city regions where the parking limit was one-half hour. The ordinates represent the number of cases in thousands, and the base line a scale of successive half-hour intervals. Again our telic continuum represents degree of fulfillment of the purpose to relieve traffic congestion by degree of adherence to a rule. We may regard the behavior of the motorists of the cars represented in the first column of the figure as conforming fully with the purpose of the traffic regulation, that is, as "within the law"; while the motorists of the cars in the succeeding columns are to be regarded as fulfilling it in less and less degree. Here again we find our J-shaped pattern, descending from maximum conformity by generally diminishing increments of difference to the end of the distribution.

Let us turn now from the field of governmental regulation to industry. Mr. Dickens hit upon the ingenious scheme of consulting the time-clock records of a factory for measurable evidence of behavior distribution. Figure 5 represents his summary of the time-clock cards of 25 male employees of the Onondaga Pottery Company, Syracuse, New York, over a period of about 13 weeks.

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<sup>5</sup>*Ann. Amer. Acad. Pol. & Soc. Sci.*, Sept., 1927, p. 83.



The subjects were day-workers. The data recorded are the times at which the clock was punched in the morning. There are 1277 reactions in all. The time at which work began was 7:25 A.M., and those who were late were penalized by a deduction of pay according to their lateness. We have constructed a telic continuum extending from "on time" (or complete conformity with the employers' purpose of efficient factory management) toward the right by successive degrees of half-hours of lateness. Mr. Dickens found that 85 per cent of the reactions were "on time," 12.7 per cent were within the first half-hour of lateness, 1.6 per cent were within the second half-hour of lateness, and the remainder, .4 per cent, were within the third half-hour. It will be seen that this array conforms to the J-shaped pattern of distribution.

Figure 6 is a graph of similar data gathered by Mr. Dickens, comprising 2545 reactions of 50 male piece-workers at the same factory during the same period. The percentages on various steps range by successively diminishing amounts from 78.6 per cent "on time" to .1 per cent "punching-in" during the fourth half-hour of lateness. The piece-workers, therefore, follow the same tendencies in their distribution as the day-workers.

Figure 7, contributed by Miss Dorothy Loeb, shows the reactions of 271 employees of a city welfare department when told it would be necessary for them to register with the Civil Works Administration for continuation of their employment. A few cases are included in the left-hand column who had already registered before this announcement was made. Our telic scale here may be considered as ranging from very prompt compliance, that is, registration on the same day, to registration four working days later. The degrees of compliance corresponding to these one-day scale intervals may be described as very prompt, prompt, moderately prompt, slightly delayed, and delayed. The number of cases falling on these steps are 187, 56, 21, 5, and 2, respectively. Again we see a positively accelerated J-curve, ranging from maximum conformity or fulfillment of purpose to the least fulfillment.

Figure 8 takes us from the economic field to that of religious behavior. Miss Basia Zambrowsky has studied the behavior of Catholics at the Cathedral in Syracuse, New York, in stopping before entering to dip their fingers in holy water and make the sign of the cross. The data are compiled from a number of masses on

different Sundays. The continuum positions and distributions are as follows: Complete compliance in carrying out the purpose of the sacramental, that is, dipping the fingers and making the sign of the cross, is the first position at the left.<sup>6</sup> Of a total of 1557 cases, 975, or 62.7 per cent, gave this reaction. The second position, expressing the purpose of the ritual in slightly less degree, is touching the font (but not dipping the fingers) and making the sign of the cross. One hundred twenty-seven subjects, or 8.1 per cent, made this response. The third recognizable degree of fulfillment is making the sign of the cross without either dipping the finger or touching the font. Those who fell on this position numbered 13, or .8 per cent. The fourth position is dipping the finger but not making the sign of the cross. Twenty-eight, or 1.8 per cent, reacted in this manner. The final category, which does not properly belong to the continuum of conformity at all, consists of walking in without performing any ceremony whatsoever. This includes 414, or 26.6 per cent of the subjects.<sup>7</sup> A glance at this figure reveals the same general tendencies as previously noted, with certain exceptions. The distribution upon position 3 is lower than it should be to accord with our theory of the positively accelerating J-curve, and the final category, non-participation, comes up considerably higher. The increase upon the last position may show a tendency toward division among Catholics in regard to this ritual, or it may suggest the presence of some non-Catholic visitors. If we formulate our J-curve hypothesis, however, only upon the basis of those who, in some measure, *conform*, and exclude the others, the distribution upon this last step may be legitimately ignored.

Figure 9a (small graph), also contributed by Miss Zambrowsky, represents the behavior of Episcopalians with reference to the custom of bowing in silent prayer upon taking their places in their pews.

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<sup>6</sup>Actually the "church teaching" is that the making of the sign is to be accompanied by saying the prayer "In the name of the Father, Son, and Holy Ghost, Amen." In practice, however, owing to the employment of the inner or "silent" method of praying, it is impossible for another person to tell by observation whether the prayer is being said. It seems proper, therefore, to omit this requirement from the first position in a continuum of outward, observable behavior.

<sup>7</sup>The justification for arranging the steps in this order is based upon consultation with Catholic authorities, priests, Catholic sisters, teachers, etc. Those consulted were in close agreement in holding the sign of the cross to be a more fundamental part of the ceremony than dipping the finger.

The telic continuum represents the degree of satisfaction of the purpose involved in this ceremony, which is construed as putting the participant in the proper mood for the service to follow. The recognized degrees range from the usual practice of pulling out and kneeling upon a hassock and bowing the head upon the arms (position 1), on the one extreme, to taking one's seat without any bowing whatsoever (position 6), on the other extreme. Position 2 represents a rather unusual form of observed behavior, consisting of kneeling upon the hassock but looking straight ahead instead of bowing the head. Position 3 represents kneeling partially, that is, with knees on the hassock and body also resting on the edge of the pew, and bending the head. Position 4 is sitting, but leaning forward from the hips and bowing the head. Position 5 consists of sitting with the body upright in the seat, but bowing the head. The total number of cases observed was 519. Here we see a general tendency to diminish in proportions as we go toward the non-complying end of the continuum. The positive acceleration in this case, however, does not seem to be present. Non-conformists (the final position) in this distribution present a class similar to those among the Catholics who failed to perform the holy-water ceremony and may be neglected in our formulation of the pattern of conformity.

In Figure 9a, as in some of our other figures, it is obvious that we have no proof that the sizes of the intervals between the continuum positions are equal. And if they are unequal, we do not know what the true intervals should be. We cannot even be entirely certain that these positions are arranged in correct order. We have, in other words, no scale upon this continuum. In order to determine what the true order and scale values of the positions should be we have, in the case of Figure 9a, prepared instruction sheets and enlisted the support of a group of judges. Our instruction sheets contained the continuum positions mimeographed as strips; and we requested each judge to cut these strips out and paste each of them along the edge of a standard-sized sheet of paper, according to the place he thought it should occupy in relation to the other continuum positions. His standard of judgment in each case was to be the degree in which he felt that the particular manner of kneeling or bowing satisfied the purpose of the ceremony, namely, that of putting the participant in a fitting mood for the service to

follow. Estimates of this sort were obtained from a hundred judges, most of whom were members of the Episcopal church. The distance of each strip, as placed by each judge, from the left-hand edge of the paper was then measured in 1/4ths of an inch, and the frequencies plotted for each strip in cumulative fashion. The point where each of these cumulative curves cut the 50 percentile line (that is, the median of each distribution) was taken as the proper scale position of the statement in question.<sup>8</sup> Laying out these intervals along a base line, the data of Figure 9a were replotted, and the result is shown in Figure 9. It will be seen that positions 2 and 3 are interchanged from their former relationships; and this fact, together with the increase in size of the intervals adjacent to the first and last positions, gives the distribution slightly more of the J-form than it possessed in Figure 9a. It is still conspicuous, however, as compared with the other figures in its discrepancy from the true J-form. We shall discuss the factors entering into this distribution more fully later.

Figure 10 represents the degree of kneeling in two Syracuse Catholic churches, as shown in data compiled by Mr. Arthur Pietrafesa. The combined data comprise 582 cases. The positions respectively represent complete kneeling, partial kneeling, and no degree of kneeling. Since only two of these three positions represent degrees of conformity, the theory of the J-shaped distribution of conforming behavior cannot be said to be here fully exemplified. These results, however, are not contradictory to it. The percentages on the three positions, respectively, are 80.4, 13.6, and 6. In this distribution there is no terminal increase in the number of non-participants.

Figure 11 is derived from so few cases that it probably is not statistically reliable. The data, collected by Mr. Robert Semple, are arranged upon a continuum dealing with participation in congregational singing. The position at the left represents singers, the middle position those who did not sing but read (or followed the hymn with their eyes) as it was being sung, and the right-hand position, those who took no part whatever. Here again there are too few positions of conformity adequately to test the J-curve theory.

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<sup>8</sup>Cf. Thurstone (6). Our method was similar in general principle (though differing considerably in detail) to that suggested by Professor Thurstone.



The number of observations totaled 54; and the numbers in the columns from left to right are 30, 14, and 10 respectively.

Figure 12 is similar to the time-clock records of arrival at a factory. The data, compiled by Miss Eleanor Lathers, represent observations of the time when 223 individuals arrived at a certain church on a Sunday morning. The figure shows, in the left-hand column, those who were "on time"; and on successive steps to the right are indicated the proportions of those who were late (that is, who arrived after the service had begun) by successive intervals of four minutes. The tendency of distribution again clearly resembles the J-form.

Figure 13, reproduced from *Student Attitudes*, by Katz and Allport, indicates the distribution of the beliefs regarding the nature of the deity among male Catholic students at Syracuse University in the year 1926. The position at the extreme left represents an Old Testament conception of the deity as personal creator and ruler, while that at the extreme right states that natural laws prevail, that there is no personal deity, and that we should be agnostic regarding spiritualistic notions of the universe. The proportions of the cases, ranging from complete compliance or conformity at the left to the least conformity at the right, again exhibit, with the exception of one column, the usual J-shaped distribution. This interpretation, of course, rests upon the assumption that the view of God as a personal creator and ruler fulfills more adequately than any other view presented the purpose of the Catholic doctrine approved for members of that faith.

From the data so far obtained, it therefore appears that when we plot the distribution of behaviors in a situation where individuals are said generally to conform we find the following condition: Rarely, if ever, do we find that all the individuals conform completely. A varying number conform only in partial degree. The proportions of these are distributed in a diminishing fashion as we proceed to the wider variations from the modal act. Their degrees of diminution, moreover, become less as we proceed out toward the deviating extreme. In all our observations, with the exception of Figure 9a, no cases have been found in which the use of the telic continuum to record degrees of performance of the common



act failed to give us at least a fair approximation of the J-form of distribution.<sup>9</sup>

In certain fields of behavior, a number of individuals may be found who do not conform in any degree. These will vary in number according as our sample includes more or fewer who have been under the influence of the common stimulating pressure. In traffic ordinances, for example, practically every motorist in the city is potentially affected, and there is material punishment for non-conformity. In the taking of holy water on entering church, only certain classes of people are affected, and there is no punishment for non-conformers. The occurrence or proportions in our samples of these groups who "do not belong" are, so far as our present techniques of prediction are concerned, quite fortuitous; and we therefore limit our hypothesis to the distribution of those who in some recognizable degree *do* conform.

Two objections will probably be raised at this point. First, some of the continuum positions we have been using are purely *a priori*, logical values, rather than empirically or experimentally determined steps. There is no way of knowing that the intervals between the positions of such a continuum are of equal psychological value. We do not know, for example, whether touching the font and crossing one's self is equidistant between dipping the finger and crossing and simply dipping the finger, or whether it should be nearer to the complete ceremony than to the dipping. Nor do we know that going *very* slowly past a red traffic signal is just half-way between a complete stop and slowing up *slightly*. So far as it affects our results the force of this objection is admitted. It

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<sup>9</sup>A full statistical treatment might require that the probable error of the difference of proportions in the columns of our figures be computed. Though we have not done this, it may easily be predicted that some of the differences would be less than three times such a probable error, and some would be considerably greater. We do not rest our case for the J-hypothesis, however, upon the statistical significance of the difference between distributions on the steps or positions, so much as upon the fact that twelve out of thirteen of our figures show the J-distribution exactly or by close approximation. That a *series* of four or five step differences should be nearly always in a successively declining ratio, owing to the fact that this would be so extremely unlikely to occur by chance, points to a constant tendency in our results regardless of what the probable error of the differences of proportions between any *two* of the step frequencies might be. These general or mass considerations seem to give a statistical significance to our interpretation quite apart from probable errors of proportion in any one figure.

will be necessary before a complete proof of our hypothesis is obtained to construct and apply scales by psychophysical techniques, perhaps similar in principle to those of Professor Thurstone.<sup>10</sup> The full effects of constructing and using psychophysical scales in investigations of this type remain yet to be seen. The psychophysical scales thus far constructed by other investigators have been based mainly upon an affective or ideational, rather than upon a telic, continuum.

There is clear proof, however, that in a number of instances our J-forms of distribution could not have been the result of using continua of unequal position intervals. It should be pointed out that five of our continua were true scales, that is, they contained positions between which the intervals were equal in the physical and exact sense (Figures 4, 5, 6, 7, and 12). And it is in these cases that we find the J-curve of distribution not only present, but present *in the clearest and sharpest form*. In view of this fact the force of the objection that some of our continua do not represent true scales becomes considerably reduced.<sup>11</sup>

The second possible objection is that we have not taken small enough intervals between our continuum positions and have not extended our records far enough on the left. For example, in the investigation of length of parking time (Figure 4), some cars were probably parked for *less* time than the half-hour allowed by law. If, therefore, we took units of five minutes rather than one-half hour and

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<sup>10</sup>That is, such use of psychophysical scales will be necessary before our hypothesis can be known with certainty to hold for conformities upon a purely implicit, telic series (like acts of rituals, kneeling, etc.), as it holds for objective scales of measurement (such as units of space and time).

<sup>11</sup>It has been argued that even these scales of physically equal units should be reduced by psychophysical methods to scales of psychologically *equal-appearing* intervals. A half-hour more of violation of the parking-time limit, for example, does not seem so long or so flagrant a violation after one has already left one's car three hours over time, as it would seem for the first half-hour after the legal time limit had expired. If this were done, however, it would not detract from our hypothesis, since the J-form of distribution would still remain. There is good reason, however, for *not* accepting this contention for a recasting of our continuum units. In some instances, of course, no other way of constructing a scale can be found than the subjective method of equal-appearing psychological intervals; as, for example, in the scaling of the different ways of performing the holy-water sacramental. But there is no reason to make a virtue of this necessity and extend the subjective method into continua where objective determinations are readily possible. What we are interested in is the

plotted the number of cases, we should find not a J-curve, but a curve with two slopes, having a pointed, steep, and skewed character. Or, in stopping before the red light, some motorists may put on the brakes more quickly than others and come to a stop *behind* the point which the law actually requires. This fact, if represented upon an extended scale of time units, would again give a two-sided, skewed distribution. Again, employees may not only come to a factory on time, but ahead of time; and so on. This objection, though fully conceded, is not in any sense a detraction from the principle as we have stated it, but only a prelude to a fuller consideration of our data as distributed upon a non-telic continuum, a task to which we shall presently turn. It should be noted that, so far, while we have in some instances used physically measurable and equal empirical units, we have spoken only in terms of a *telic* continuum, that is, in terms of the degree of fulfillment of the purpose of a common rule. From this standpoint it is legitimate to group together all the cases where the behavior is "more than" that required by the rule, as simply "within the law," or as satisfying completely the requirement. Though some may conform more quickly or vigorously than others, the content of one's act cannot be more conforming than conformity itself, that is, than

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degree of conformity to a practice which, from the standpoint of any one individual tested, is external to himself, a practice, that is, which is standardized by objective, physical units of measurement and held constant for the entire group. Although an individual might think of the marginal half-hour as of less significance after a long than after a short violation, and, although a judge might punish it less severely in proportion, nevertheless both motorists and judges think in absolute as well as in relative time quantities. Drivers carry watches or see clocks in shop windows; and they are aware of the actual passing of time. They very frequently plan their errands ahead according to the parking time allowed, even though their plans often take them longer to execute than they had anticipated. Or again, some may plan to be only five or ten minutes (or some other interval) late in moving their cars. It is obvious that all these plans are based upon anticipated *actual* time, and therefore upon attempts at precise, objective estimates, rather than upon retrospective judgments of how long an elapsed interval seems. Other circumstances being equal, there is also as great a likelihood that motorists may have their cars "tagged" during the 10th half hour of violation as during the first. Each hour they leave their cars parked is probably thought of as an "actual" hour during which they have violated the purpose of the ordinance, an actual hour during which the presence of their car at the curb has contributed to the city's traffic congestion. Such deterrent factors are obviously based upon actual rather than psychological time.

the modal act. We have a right, therefore, to construe the data as falling upon such purely telic continua and to formulate the principle of the J-distributions which results, so long as we make it clear that our formulation applies only to distributions as plotted upon a continuum of this sort and indicates only degrees of compliance with a prescribed standard.

Before attempting a formal statement of the J-curve hypothesis, we are brought finally to the necessity of a clearer definition of the field with which this hypothesis deals. We have spoken in our preceding discussion of three necessary factors. *First*, there must be a clearly recognizable, unequivocal purpose to be achieved by the behavior in question. *Second*, there must be some kind of law, rule, regulation, or code, in the language of which one may find stated the "proper" or required mode of behavior by which this purpose is to be achieved. This prescribed act is that which we have placed as the extreme left-hand position of our telic continuum. *Third*, a fairly large proportion of the population studied must do this prescribed act.

A little thought will convince one that these three requirements are not arbitrarily chosen, but are all necessary and are closely interwoven. In the first place, a *purpose* is necessary because acts which people perform in common, such as customs and institutions, are never sporadic, random activities like the reflexes of a newborn infant. They are meaningful adjustments to definite situations. There must always be some end to be achieved before a public rule can be made or even implied. The end may not always be for the interests of the greater number; but it is at least a recognizable purpose of some person or persons. Secondly, it is necessary that there be a *rule* defining the expected behavior before the purpose can have any widespread or practical significance. Before we can have conformity of action, we must have a standard to which people can conform. The term "rule," however, should be given a wide construction. It may be taken to indicate a mode of behavior prescribed, established, or defined in any one of a large number of ways, providing the prescription is definite. The only requirement is that somewhere, at some time, the rule is *definitely stated* or is *capable of being stated* in such a way that the majority of people will recognize the statement as authoritative or as universally accepted. Examples may be found in codified law and statutes, in



canon law, in books of church doctrine and ritual, in governmental or industrial regulations, in school and college catalogues, in manuals of etiquette, and in any of the accepted phrases by which customary behavior is described. Usually, the rules are most precisely referred to and formulated by heads of "institutions" or reputed authorities on institutional procedure. Thirdly, there must be *a fairly large proportion of behavior in compliance with the rule*, because, in situations where only a meager minority conform, it will be likely that the influences tending to produce conformity, such as education, punishment, and social approval, will be so weak as to be outweighed, in different instances and in varying amounts, by other considerations. In this event no very constant proportions can be expected to fall upon the various degrees of the continuum. If a traffic ordinance, for example, exists merely on the statute books and is very loosely enforced, all talk both of the law and degrees of conformity to it are purely academic matters without counterpart in actual behavior. Almost any proportions of the varying degrees of compliance with this ordinance may be expected according to the time and local circumstances. A rule *is* a rule in an effective, behavioral sense only when a fairly large proportion of people obey it. How large a proportion must obey it is a question to which we shall presently return.

It is not only the fact of a fair degree of conformity which gives societal behavior distributions a character conducive to their prediction, but the common purpose and the rule itself are indispensable aids in the making of a scale by which the distribution can be described. Before we can have degrees of deviation from the rule, we must have the rule itself; for the deviations are merely other, or lesser, acts which are included, in a meaningful way, in the complete performance of the rule. For example, bending the body slightly is an act which is meaningfully included in the more thoroughgoing response of bending not only the body, but the knees and head as well. Completely stopping before a red light may be said to include (since it "goes farther than") slowing slightly, or slowing considerably. We have here a principle of *teleological inclusion* which is the foundation of our telic continuum. It is also apparent that such degrees of teleologically included behavior could not be recognized and selected were it not for the purpose for which the rule was established; for that purpose establishes the criterion



of their relevancy to the rule. We do not, for example, mistake such bendings of the body as are necessary in order to pick up a hat or a hymn-book with the bowings in prayer which are to be recorded as degrees of adherence to the devotional requirements. We must have the purpose or meaning of the entire situation before these partial steps can be identified.

Returning now to the requirement of a fairly general conformity in full compliance with the rule, the following question must be answered: What proportion must fully conform before we can have a societal situation to which our hypothesis of the J-curve of distribution can be applied? This question cannot be answered satisfactorily except by further experiment. For the purpose of our present hypothesis, however, we may say that the lower limit of this proportion of conformity must be approximately 50 per cent. Upon inspecting the solid black figures of our charts it will be seen that, with a single exception, all are either true J-forms of distribution or close approximations of that form. In practically all of these typical distributions the proportion of cases falling on the extreme left-hand position is 50 per cent or more. One drops to 46.2 per cent. Some of them range as high as 85 and 90 per cent. In Figure 9a, however, which is the only distribution departing conspicuously from J-form, there are only 32 per cent of the cases upon the first, and most frequently represented, position.<sup>12</sup> It seems justifiable, therefore, to accept the 50-per-cent limit as our tentative criterion for requisite conformity.

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<sup>12</sup>There are further indications that we are dealing here with separate categories of response, freely chosen according to the individual's temperament, rather than with a graded teleological series. For example, when the judges were asked to estimate the scale value of these positions of kneeling and bowing by the method previously described, the variations in their estimates were very great. Five of the six statements were placed by different judges at positions ranging across the entire sheet. Such slight agreement as to the degree in which these acts satisfy the purpose intended is evidence either that the purpose itself is not commonly agreed upon, or that, among Episcopalians, no precise degrees of fulfillment are recognized as attaching to particular outward acts. Several Episcopalians, including a rector, furthermore volunteered the statement that in the Episcopal ritual no definite requirement or propriety in this matter exists. Here, then, it seems that we have a behavior field in which the conditions of the J-curve hypothesis are not present. While there is probably a vaguely recognized, common purpose, there is however no rule, and no degree of conformity sufficient to be influential in affecting the general distribution.

Putting together these three requirements, we may define the conditions under which the J-curve hypothesis may be said to operate as the conception of "a field of conforming behavior." *A field of conforming behavior may be said to exist when one-half or more than one-half of the individuals included are performing an act which, in the form in which they do it, has been "prescribed" or deemed proper according to some rule which has been formulated or implicitly recognized for accomplishing a definite purpose.*

With these qualifications in mind, let us see what generalizations can be suggested from the data thus far obtained. It is admitted that our case sampling has sometimes been inadequate and the fields investigated are few. Our principle is therefore stated purely in terms of an hypothesis to be tested by further observation.

Our hypothesis, then, is this: *If, in any field of conforming behavior (see definition given above) we apply a scale whose steps are variations of the behavior, ranging from the prescribed or "proper" act, which most completely fulfills the behavior's purpose (on the left) to that which gives it the least recognizable amount of fulfillment (upon the right), the following will occur:*

- a. More instances will fall upon the step at the extreme left than upon any other.*
- b. The successive steps from left to right will have a respectively diminishing number of instances.*
- c. The decline in the number of instances will decrease as we proceed by successive steps from left to right.*

To state the hypothesis in another form: *In a field of conforming behavior degrees of conformity are distributed upon their appropriate telic continuum in decreasingly diminishing proportions as one proceeds from the most widely practiced form of the act toward the greatest recognizable deviation from that form.*

Or, more simply: *In a field of conforming behavior, the distribution of degrees of conformity upon their appropriate telic continuum is in the form of a curve of positive acceleration.*<sup>13</sup>

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<sup>13</sup>In some of our distributions there seems to be evidence of what we may call a J-curve of "non-conformity." For example, in cases where there is tendency towards breaking away, or the obsolescence of a law, custom, or ritual previously generally obeyed, we might expect a piling-up of some instances on the final, or non-conforming position beyond the end of the telic continuum; and on the least recognizable telic steps just adjacent toward the left we might expect a successively diminishing number of cases.

## II. DISTRIBUTION UPON AN EMPIRICAL OR NON-TELIC CONTINUUM: THE DOUBLE J-CURVE

We are now ready to turn from the telic continuum to behaviors as measured upon an objective continuum whose degrees are established not by meaning or purpose, but by disinterested physical measurement. Here we shall be concerned not with whether, or in what degree, the behavior fulfills a purpose or obeys a rule, but merely with its distribution in terms of small units of space, time, rapidity, or other non-telic dimensions. A man from Mars, for example, who knew nothing of the meaning of a church service or factory employment, or what constitutes "on time," or "lateness," could readily stand at the entrance of a building with a watch and record the number of people entering in successive five-minute intervals, beginning at a time when there was nobody arriving, and ending at a time when again no one was arriving. The same man from Mars might record the degree of acceleration or deceleration of automobiles approaching a red light, though he knew nothing whatever about city government. Our data, in other words, can be conceived as distributed upon a basic continuum of an *empirical* sort, a continuum of which our telic form has been derived by a special condensation and reinterpretation.

Figure 5 A is an empirical distribution summarizing some of the data gathered by Mr. Dickens in his time-clock studies. The data presented are the same as those in Figure 5. The scale used, however, is different in that the units on the baseline are non-telic; that is, instead of being construed as "on time," or "1st half-hour of lateness," etc., they represent merely successive ten-minute intervals, from the earliest record the observer could obtain (time of opening the factory), which was 6:30 A.M., up to the latest time punched on any of the cards, which was about 9:40 A.M.<sup>14</sup> The

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This reversed J-curve at the other end of the scale would include not only those who are entire non-conformists, but those who, being less bold or indifferent, pay their respects to the old custom by performing it in a perfunctory or sketchy fashion. Such a combined field of conforming and non-conforming behavior would be then described by a U-shaped distribution curve. This interpretation is not founded upon sufficient evidence to be more than a suggestion for future research. It is possible that the distribution on the last two positions of Figure 8 may be accounted for in this fashion.

<sup>14</sup>Mr. Dickens actually used five-minute intervals in collecting his data. These are here combined into ten-minute intervals for convenience in presenting the figures.

employees were not supposed to start work earlier than the time indicated by the solid vertical line, namely, 7:25 A.M.; but if they started later they were penalized by a deduction from their pay. This, of course, was the type of scale which Mr. Dickens used in actually gathering his data. The telic distribution in Figure 5 was constructed later by combining all the cases arriving by 7:25 A.M. as "on time," and combining the intervals following into successive half-hours of lateness. (Such data as we have so far obtained on non-telic or empirical continua are presented in the shaded figures in the middle columns of the charts.) It is to be noted that the actual mode of conformity in punching the clock is 10 minutes to the left of the "factory rule" time for starting work, because it was necessary for many of the men to be on hand about ten minutes early in order to get their clothes changed, their machines put in readiness, etc. The *dotted* vertical line therefore indicates more truly the "economic" mode of the conformity distribution.

Now the main fact to observe is that this distribution upon a purely empirical continuum has two slopes rather than one. Both of these slopes are steep, but unequally so, with the mode which separates them forming a peak asymetrically placed between the extremes of the scale.<sup>15</sup> The cases which were all lumped together in our telic distribution as merely on time are now spread out in successively diminishing proportions on the left of the actual empirical mode, similarly to the way the cases are spread out on the right. We have a distribution on steps of "earliness" corresponding to that on steps of "lateness." The result is that we really have two J-curves, placed back to back, with their modes coinciding in the single mode of the entire distribution.

Figure 6 A, also from Dickens, shows the original distribution of the data of Figure 6 upon an empirical continuum. These are piece-workers, however, and consequently being "early" is a factor

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<sup>15</sup>The slight increase at the extreme left, 6:30 A.M., is no doubt due to the fact that, since that was the time of opening the factory doors, it was the earliest moment the workers could punch the clock. Had the observer been present earlier upon the street outside the factory, noting the moments of arrival of these earliest employees, he would probably have found some arriving even before the doors opened; and if these were plotted as earlier arrivals on an extension of the baseline to the left, instead of being included, as they now are, among the 6:30 "clock-punchers," the curve would probably descend in true J-fashion upon the left extreme.



of considerable economic importance to them. The watchman supplied the information that from a half-hour to an hour of "earliness" could well be used by this particular class of workers in changing their clothes, laying out their tools, and getting materials and machines ready for operation, so as to secure the maximum output and the highest pay possible for the day's work. This undoubtedly explains the long interval between the actual mode at the dotted vertical line and the "factory rule" time (solid vertical line). The largest proportion of this class of employees will be seen to have punched the clock at the first possible moment. Here again, if the observer had arrived before the factory doors opened, he might have found some of the men coming still earlier and waiting outside. In this case the 6:30-6:40 column would not be quite so high; and some cases would be distributed still further to the left. As a matter of fact, the factory records did show one or two cases (not indicated on the graphs) punching the clock earlier than 6:30, when the factory doors were inadvertently opened before that time. It seems justified, therefore, to draw a hypothetical dotted line representing the J-curve on the left-hand side of the empirical continuum. If we do this, we shall again observe that recording behaviors in a field of conformity upon an empirical continuum gives an asymmetrical, double J-shaped distribution.

Figure 7 A (Miss Loeb's original empirical plotting of the data in Figure 7) shows the exact day on which city welfare employees signed up with the C.W.A. The telic positions of promptness are now successive steps of twenty-four hours' duration, and the full range of steps is given before the modal date as well as after it. Some of the employees, perhaps sensing that a change would have to be made in their registration, began to sign up a few days before the general order was given. Strictly speaking, there was neither rule nor conformity (though there was a purpose) until this announcement was made; nevertheless we find individuals registering upon earlier days, corresponding to the "ahead of time" arrivals at the factory. This fact again gives us a sharply pointed, unequally sloping distribution resembling the double-J-form.

For the distributions of religious ceremonials the non-telic situation is somewhat more difficult to ascertain. Since the units of behavior are not capable of quantitative denotation, but are differing *patterns of acts* which are given significance only through being



placed on a telic continuum, it seems impossible for an empirical continuum to be introduced. Nevertheless, it is likely that a non-telic continuum of some sort can be projected. A continuum which suggests itself is that of the degree of some personality trait which may characterize individuals falling upon different telic positions. In one of Miss Zambrowsky's sets of observations there was recorded a type of behavior which seems to belong at the left of the step of full compliance with the rule. This position comprises those who, while crossing themselves in the holy-water sacramental, stood still and made *visible movements of the mouth* in saying the prescribed prayer. Since merely praying "inwardly" seems to be regarded as adequate fulfillment of this ritual from an ecclesiastical standpoint, we may consider those who make lip movements as doing slightly more than is required. Such behavior is comparable roughly, to the behavior of those who arrive ahead of the required time in factory employment. Now it seems possible to regard these visibly praying individuals as more "pious" (either in outer manner or in fact) than those who made no lip movements. And we might translate our telic continuum of compliance with a rule into a continuum of degrees of the personality trait of "piety." And on such a non-telic, "piety" continuum, these persons who made visible lip movements could be recorded upon the position at the extreme left (that is, as most pious), and one position to the left of the telic mode. In Figure 8 A, a different set of observations from that shown in Figure 8, we find that 11.5 per cent of the total number fall upon this position. If this interpretation is correct, the complete, non-telic distribution of this observance again suggests the asymmetrical, off-center, double-J-form.

Figure 12 A is a distribution of the time of arrival of church attendants at a Sunday service in terms of four-minute intervals beginning with the first arrival and ending with the last. The vertical line marks the position of the beginning of the service. This set of observations (recorded by Miss Lathers) constitutes a different, but comparable, series from those shown in Figure 12. Periods of lateness or earliness are treated simply as empirical time intervals, and the "on time" cases are shown in their empirical distribution to the left of the opening time of the service. The form of the distribution suggests that shown in Figure 5 A and again illustrates the asymmetrical, double-J-pattern.

Of the distribution of traffic behavior upon an empirical continuum we have as yet made no observations. Figures 1 A and 4 A are purely hypothetical illustrations. The red-light-stop situation might be studied on a physical measurement scale in terms of degrees of deceleration of automobiles, ranging from a deceleration so great as to produce a quick stop a considerable distance behind the sidewalk crossing to no deceleration at all (or even to an acceleration in exceptional cases). Another method might be to record the point on the street at which speed was first diminished. A hypothetical curve of this character is shown in Figure 1 A. For Figure 4 we have constructed Figure 4 A, again hypothetical in character, showing a theoretical distribution upon an empirical time continuum of those who have parked their cars for a shorter as well as a longer time than that allowed by law.

Although our data are thus far meager we may now formulate tentatively the second portion of our hypothesis. This portion deals with the complete distributions of conforming behavior secured by scales which are other than telic in character, distributions, in other words, which are in terms not of degrees of compliance with a rule, but of a simple, objectively descriptive statement.

Our hypothesis is as follows: *In any field of conforming behavior (see definition previously given) the distribution of measurable variations of that behavior upon a relevant, but empirical, or non-telic, continuum is in the form of a steep, uni-modal, double-J-curve (that is, a curve having positive acceleration of both slopes), in which the mode is likely to be off-center, and the slopes are likely to be asymmetrical.* The distribution, in other terms, is "leptokurtic," and probably asymmetrical both in area and in range.

One who approaches this problem for the first time will be likely to dismiss these distributions with the statement that they are merely normal probability curves which have been steepened and skewed. This, in the writer's opinion, is an unfortunate error. An ordinary skewed curve, which is a departure (owing to disturbing factors) from the normal, is, like the normal curve, negatively accelerated in approaching the mode. Our double-J-curves, on the other hand, are positively accelerated throughout the entire length of both up-

ward slopes. The common notion of skewing as a phenomenon due to a selective error of sampling, producing a distortion where the curve would otherwise be symmetrical, does not apply to these conformity distributions; we must develop a new statistical conception in its place.

A moment's consideration will show that this is true. There is no such thing, for example, as purely normal probability distribution in the times of the required arrival of individuals at appointed places, in their stopping-behavior before red lights, or in their participation in church rituals. Without any economic pressures, sanctions, or other conformity influences acting upon the individuals to make them do a particular thing, they would not do these things at all, or else they would do them purely by chance. Now in the latter case the distribution would depend upon *simple* probability (not the so-called, compound probability of the normal curve); and the curve resulting would not be bell-shaped, but flat. The distribution of behavior in relation to a rule is that of the steep, double-J-form, produced by pressures toward conformity, or it is nothing at all. Its mode is placed by these pressures at a particular point, and this point is not determined by the probability curve of individual differences, though it may in some cases be identical with it. Laws, customs, and institutions are, by their very nature, telically biased ways of behaving; and the conformity curve is leptokurtic and generally asymmetrical *from the beginning*. The only exception to the statement that the double-J-curve is independent in formation from the normal curve is the fact that personality trait differences (which of course do tend toward a normal distribution) are represented as *one factor* in the total empirical distribution of the double-J-curve. It is to be noted, however, that these personality differences are superimposed upon (or centered at) a mode established and artificially heightened by *quite a different set of influences*, namely, conforming pressures. If our samples thus far obtained are supported by later observations, no resampling from mixed populations and no elimination of "disturbing influences" (such as traffic lights, factory rules, rituals, etc.) will serve to reduce these pointed, asymmetrical, conformity distributions to the normal, bell-shaped curve. Such treatment can reduce them only to the flat curve of chance or to the absence of any regularity whatsoever.

We are dealing here not with a single set of factors underlying

a curve of distribution, but rather with several sets. Leaving out of account the mode of conformity, the descending distributions on the two sides represent, in part at least, different selective and steepening influences. On the right slope there are at work the *societal* penalties which will be inflicted in case the individual does not *go far enough* in his behavior so that he conforms; while on the left-hand slope there is at work the *biological* penalty of the needless hardship of inconvenience one must suffer through *going further* than conformity requires.

### III. SUGGESTED INTERPRETATIONS: A FOUR-FACTOR THEORY OF CONFORMITY DISTRIBUTIONS

Throughout the preceding discussion we have hinted at the factors which seem to be at work in producing the asymmetrical, double-J-distribution. Our remaining task is to render their interpretation more explicit. The analysis of conformity distributions into all their contributing elements may prove to be a long and involved task. Without placing any dogmatic limitation on the number of possible factors, we may say that there are probably at least four major types of influences at work. We may call these, respectively, the conformity-producing agencies, the common biological tendencies, the personality-trait distribution tendency, and simple chance. The first two, conformity-producing and biological influence, seem to determine the horizontal position of the mode on the  $x$  axis and tend to make the curve steep and narrow; the latter two, personality-trait distribution and chance, tend, in opposition, to lower the mode and make the curve more bell-shaped or spread out. We shall discuss these in order.

*A. Conformity-Producing Agencies.* By this term we mean any common influences such as conditioning, punishment, education, propaganda, social approval or disapproval, the use of legal, ecclesiastical, or other symbols, the invoking of traditions or customs, the appeal to "institutions," and the power of institutional controls and leaders, all of these agencies tending to make people conform to a common mode. The laws of social psychology might be included here, such as the attitude of conformity, social facilitation, impression of universality, and the like, which, though secondary rather than primary in their operation, act in the direction of making the mode



higher. A perfect conformity distribution, if such could be found, would be in the shape of a straight, vertical line at the point of the approved practice. The degree to which the distribution does pile up at this point and the extent to which the point is pushed toward one side or the other are in part functions of the strength of the conformity-producing influences.

*B. Common Biological Tendencies.* By treating the biological tendencies separately from the conformity agencies we do not imply that the latter are apart from the realm of biological realities. Unquestionably, behind our common sanctions, institutional symbols, and training, there lie biological needs which are fulfilled through these agencies. We refer here, however, not to the biological activities fulfilled indirectly through these "societal" agencies, but to those operating in a more direct and primitive manner, that is, those ways in which every human organism reacts to its raw, physical environment, and would react even if no other human beings were present. Professor Giddings' example of a temperature so low as to produce an almost complete similarity of individuals' protective behaviors is a case in point. Under ordinary conditions, the amount of clothing worn, food consumed, water drunk, exercise enjoyed, sleep taken, or the speed of walking, talking, etc., would probably tend, in an unselected population, toward the normal probability curve of individual differences. But as conditions change, as a sharp common need or crisis arises (such, for example, as a famine or a forest fire), the strength of the biological factor increases relatively to that of the other factors, and we find a displacement of the mode in the direction of that act or that degree of action which will secure the minimum adjustment necessary for life.

The part played by common biological tendencies in our conformity distributions does not usually involve such crises as these. In fact, one of the principal reasons for having public regulation is to prevent serious maladjustments and assure a steady satisfaction of wants in advance of their arising. The common biological influences which do operate in these regulated activities may perhaps be summed up under the concepts of inertia, economy of effort, or resistance to the thwarting which is inevitable, in some degree, under any scheme of public control. An example would be the natural aversion to getting out of bed early in the morning in order to be at work at a required time, or the effort required to kneel in prayer



or to stop and perform a ceremony before entering church. The ideal in practice is to have the modes which would be produced by the biological and the conforming influences (if they acted separately) coincide. An attempt at such agreement is illustrated by the successive timing of boulevard signal lights so that a motorist, if once he gets "in step" with the lights, can drive for a considerable distance without slowing down or shifting gears.

In the curve of the time of arrival of employees at a factory, Figures 5 A and 6 A, we may picture the common biological tendency as operating *against* the conformity-producing agency. Inertia must be overcome in order to get out of bed and get to the factory. If this inertia were the sole factor operative in determining time of arrival, it would probably push the modal time continually further to the right, until it reached an hour when most workers found it practically no effort to be present. The pressure brought to bear by the factory managers, however, to have the work begin early, and the system of pay by the piece which bestows a reward upon being punctual, tend to hold the time of modal arrival constant, or even to push it toward the left in order to offset the effects of the tendency in the opposite direction. Consequently, the mode actually established is probably a compromise between these two influences. More exactly stated, it is the point at which an equilibrium between the biological and the conformity-producing tendencies is established. Similarly, the modal stopping behavior of motorists facing the red signal light is assured only by maintaining the conformity-producing agency (punishment) at greater strength than the physiological inertia which must be overcome in applying brakes and shifting gears. As soon as law enforcement lapses we find motorists going ahead without slowing down. The J-curve is then broken down, to be replaced by a distribution showing a mode of fairly uniform city driving spread out somewhat by normal personality differences.

It will be noted that where biological tendencies are standardized in their operation through conformity-producing agencies the combined action of these influences may considerably increase conformity. This happens with regard to the rhythms of sleeping, eating, recreation, going to work, etc. The natural tendency to perform these acts at intervals fairly uniform for all is greatly reinforced by customary influences which demand the concerted, standardized action necessary for a social organization based upon division of labor.

When many human needs are satisfied, however, as they are today, not through individual effort, but by centralized mass production depending upon conformity of action, other problems emerge. Increasing conformity in time of eating, and at the same time making the fuel for cooking depend not upon individual effort but upon a concerted economic system (further conformity) of which a power plant or gas main is one component, sharply increases the demand upon this production source at a particular time. This is the problem of the "peak load" familiar in many branches of public utilities.

*C. Tendencies of Personality-Trait Distribution.* The third of our list of factors affecting the conformity pattern is one which needs to lessen the steepness of the slope and to spread out the distribution. Just as common biological tendencies operate with conformity to make individuals react alike, so the natural variations of physique, temperament, and endowment which characterize individuals tend to make them react differently. And this latter tendency, though it may be restricted in its operation, cannot fail to exert some influence upon the distribution. It is well known that if an attribute of living organisms which is capable of being measured is chosen and measured in an unselected group, the resulting distribution is likely to take the form of a symmetrical, bell-shaped curve of compound probability, in which the median, the mode, and the mean coincide. We are not, of course, arguing that the normal probability curve is universal in nature. It may depend largely upon human purposes and human scales of measurement. Our only assumption here is that when our equal-unit scales are applied to biometric and psychological functions we can predict that such a distribution will be likely to result unless there is some selective factor in the sampling. In its establishment of the mean and mode through a balancing of factors occurring by chance combination upon either side, the curve of normal probability differs in origin from the double-J-curve of conformity. In the latter case the distribution is built up, from the start, about a mode which is not established by probabilities, but is by its very nature highly selected, unbalanced, and improbable in the usual course of events. For it is set at that point by the voluntary actions of individual human beings, acts which involve so much caprice that they follow no law and cannot successfully be predicted.

Now when some conformity or biologic crisis establishes the mode of behavior at a certain point of the continuum, what happens to

the varying potentialities of individuals which, when not over-ruled by stronger influences, express themselves as a normal probability curve? What probably occurs is that the median of this normal personality curve moves over and coincides with the mode set by the conformity-producing and biological tendencies; and the individual differences, tapering off toward its extremities, exhibit themselves, in so far as the biologic or conformity pressures will permit, as respective degrees of deviation from this mode. The ordinary or typical individuals will comply with the rule; the individuals possessing unusual degrees of the trait brought into play will tend to do "more than" or "less than" the rule requires according to their degree of personality deviation.<sup>16</sup> The greater number, who possess little or no difference in their traits from the average, will probably not noticeably deviate from the modal behavior. They will, for example, arrive at the factory at just about the time they are expected. Those, on the other hand, who tend to be "before-hand" on all occasions, or who tend always to be more cautious than the average, will be likely to come early; and their degree of earliness will be in the proportion in which they possess this trait of promptness or caution. Finally, those who are characteristically inclined to "take their own time" on all occasions, or to be reckless, will probably manifest that dilatoriness or recklessness by being tardy; and their frequency or degree of tardiness may be an evidence of the degree in which they possess these traits.

Apart from this theoretical analysis, we have actual evidence that, of those individuals whose reactions fall along the tail of the J in our distribution of lateness, some, at least, do not fall there altogether

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<sup>16</sup>It is indeed by reference to our ordinary institutional standards that we are frequently aware, and judge the degree of, certain personality traits of our fellows. For example when the regulation requires certain associates to meet us at 9 o'clock A.M., the hour of nine becomes not only a mode of common behavior for facilitating concerted action, but a zero point on the basis of which (through repeated observations under different conditions) we may judge the trait of an associate as to whether he is habitually fore-handed or procrastinating. This common behavior may be given the name of *institutional relativity*. Though it has a wide application in personality investigations, it must not, however, be understood as signifying that personality traits, either in their origin, their recognition, or their effect on others, are dependent for their existence upon societal standards of conformity. If there were no conformity standards at all, these individual differences would still exist and would have their effect, though they would probably be more difficult to name and measure.

by chance. On the contrary they are those who have a fairly constant individual tendency toward tardiness, at least in regard to arrival at their daily work. In the distribution of degrees of tardiness shown in Figures 5 A and 6 A, the investigator has analyzed the individual time-card records and has computed the median of each individual's reactions. It was found, in the data of Figure 6 A, that, of those time-clock reactions which were more than 5 minutes late according to the factory rule, over 80 per cent were contributed by individuals whose *median* time was also tardy (data not shown on the charts).

In the right-hand columns of the charts we have suggested the possible distribution of personality differences by normal probability curves shown in dotted lines. These curves are shown as "moved over," so that their mode coincides with the mode of the double-J-distribution (also shown in dotted lines). This double-J-distribution is shown as a hypothetical curve, or as an actual frequency polygon taken from the column diagram immediately to the left. This device illustrates roughly the fact that the individuals of typical personality characteristics are the ones who conform, and also the fact that the individuals who deviate in their personal traits are distributed in successively diminishing numbers on the side of "more than" or "less than" the customary behavior. This arrangement also shows that, while the slopes of these normal curves run roughly parallel with the sides of the conformity distribution, they seldom coincide with the latter. The degree of the discrepancy between them is a rough measure of the failure of the pattern of behavior established about the required practice to give expression to the personality differences of the individuals concerned. Since the difference between the two distributions is largely one of steepness, this discrepancy may be measured roughly by the *index of kurtosis* of the conformity distribution.<sup>17</sup>

In Figure 1 B we may take the hypothetical units of time expressing rate of deceleration in driving, or the first point of slowing up, as indices of the degree of some personality trait, ranging, for example, from aggressiveness or ascendance on one extreme (those who do not slow up at all) to timidity or submission on the other

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<sup>17</sup>It should be borne in mind that the personality distributions shown in these figures are purely theoretical. They are not founded upon actual measurements but are drawn hypothetically to aid in explaining the theory.



(those who slow up very "early" or stop far behind the crossing). We may assume that if there were no other factor present besides these personality differences the distribution (as indicated by broken lines) would be that of a normal probability curve. On this point, fortunately, we have some evidence. Mr. Dickens observed the behavior of motorists approaching an intersection on which cross traffic was approaching but which was without stop signs or signals of any kind. In such an instance, since there is nothing to stop the drivers except the motorists coming at right angles, and since both motorists (being approximately the same distance from the corner) have an equal chance to go ahead, the factor which will determine whether the motorist observed will go ahead or reduce his speed, or how much he will reduce his speed, will probably be the amount of aggressiveness or timidity which he possesses in comparison with the other driver. It may perhaps be some other trait than aggressiveness, but the principle will remain the same. Now if this hypothesis is correct, since traits of this sort are normally distributed, we should expect to find a normal probability distribution in the behaviors of the motorists observed. And this, indeed, is what Mr. Dickens has found. Of the 208 motorists whose behavior was observed, 35, or 17 per cent, stopped completely; 77, or 37 per cent, checked their speed and proceeded very slowly; 71, or 34 per cent, slowed slightly; and 25, or 12 per cent, proceeded without diminution of speed. These proportions will be seen to describe roughly the normal curve.

Now when a boulevard stop sign is interposed, with police supervision and punishment for violations, we may expect the mode of the motorists' behavior to shift to compliance with the rule of stopping. The personality continuum then "moves over" and the median of the personality distribution coincides with this mode of conforming behavior. Aggressive drivers, on facing the stop sign, will now tend, in the degree of their aggressiveness, to slow down only partially or to go ahead without change of speed. These cases will fall on the right-hand slope of the double-J-distribution. The timid drivers will not only telically conform to the requirement of stopping, but may stop more quickly, or further behind the crossing, in proportion to their degree of timidity, and will thus form the slope or tail of the double J on the left-hand side.

The shaded area in Figure 3 B shows the behavior of pedestrians



facing a red light in a city without pedestrian traffic-law enforcement, that is, where personality differences of boldness and timidity are permitted to have full play. Forty per cent of the individuals, the mode, exercised a "moderate" caution in that, if they went against the red light, they took the trouble to look to the right and left. Smaller percentages fell on the steps of a complete stop before the red light (relatively cautious or timid persons) and going ahead without even looking (relatively bold or aggressive persons) respectively. The general shape of the normal curve of personality traits is again suggested. By superimposing this hypothetical personality distribution upon an actual distribution of pedestrians' behavior in a city *with* enforcement (a frequency polygon suggested by Figure 3) we can theoretically place the individuals upon the conformity distribution according to their personality traits and can estimate also the success or failure of the conformity pattern in giving full expression to their personality differences.

In Figure 7 B, since the official rule for registration was not really in existence until the order to sign up with the C. W. A. was given, the conformity pattern allowed a distinguishing expression of only one-half of the personal differences in punctuality, viz., those upon the procrastinating side. This is because the ascent of the double-J-curve on the left is so steep as to constitute practically a reversed L. In Figures 8 B, 10 B, 11 B, 12 B, and 13 B, we may postulate some such trait as "religiosity" or "piety" as affecting the distribution in the curve of conforming behavior. In 10 B, 11 B, and 13 B we find that the actual or hypothetical distribution upon which the personality continuum is superimposed is steep on the left-hand side. Its discrepancy from the slope of the personality distribution is therefore greater upon that side. In other words, the manner in which individuals behave in performing certain prescribed religious rituals seems to give a wider range of self-expression to the less pious than to the more pious individuals. There seems to be little or no opportunity to express a personal religious feeling which is deeper than the average by any ceremonial which will distinguish the participant from the average conforming church member.

The extent to which the normal personality distribution is departed from in conformity distributions has an obvious practical significance. Its measurement gives a quantitative approach to the maladjustment between human nature, with its biological and psy-

chological differences of individuals, and our somewhat standardized and mechanized civilization. In a completely mechanized industry, for example, where machines are run at a constant speed, there would be almost a complete elimination of the expression of individual differences. That is, there would be a maximum kurtosis of the curve of conforming behavior. Those who naturally reacted more rapidly than the machines would be able to run the machines; but they would have their capacities for more rapid action denied expression. Those who reacted characteristically more slowly than the machines would not only be prevented from carrying out these slower reactions in the industry, but would be disqualified from the industry altogether. The conformity-producing factor is not the only one which may suppress the exhibition and use of individual differences. The same effect may arise from the influence of common biological tendencies; but this is the case, as a rule, only in crises when the physical environment so changes as to require an unusual similarity of behavior in order to exist. In the case of conformity-producing influences, however, we have such an increase in kurtosis not as a result of crises or catastrophes, but as a part of the ordinary routine of living.<sup>18</sup>

*D. Chance.* We come finally to the consideration of simple probability. Logically, perhaps, this element should come first, since it is a background, without tendency of any kind, upon which the positive influences already mentioned play their rôles. Similarly to the "compounding" of probabilities in the personality distribution, simple chance represents a distributing rather than a concentrating tendency. It does not, however, produce the same form of distribution. For in the probability operating in personality distributions the occurrences are concentrated in a modal fashion upon a certain

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<sup>18</sup>Before dismissing the question of individuality in fields of conforming behavior we should note that a full investigation would take us into new fields. We would have to ask, for example, not only whether the rule of factory opening time or machine operation employs the degree of forehandedness or of manual dexterity natural to the worker, but whether factory attendance or machine operation *as such* is what individuals need as a means of self-expression. We would need to inquire not only whether the graded series of traffic lights fits biological inertias or differences of reaction-time, but whether automobile transportation itself is a method which makes full use of the behavior potentialities and differences of men. The question thus becomes a qualitative as well as quantitative one. It should not be confused with personnel work, or even with vocational guidance; for it is an entirely different, and hitherto uninvestigated, problem.

category and are spread out in diminishing proportions to the right and left, while in simple chance they are distributed equally in all categories. The situation is illustrated by tossing pennies. There are two categories, heads and tails. If enough trials are made, there will be found to be an equal number of cases falling in each. Similarly, in so far as simple chance factors are present in the distributions of individuals along our empirical continuum, there will tend to result an equal number of cases upon each step. If such factors were the only ones present, the curve would be perfectly flat. Although we may neglect this chance distribution for practical purposes (since it occurs everywhere equally), its presence should nevertheless be noted. It may be represented, for example, in the occasional behavior of motorists before traffic signals. Some doctor hurrying upon an emergency case might have to disregard traffic signals in varying degrees wherever possible, according to chance factors in the flow of traffic which permitted him to do so. Or again, a motorist's brakes might slip in an unpredictable degree, or there might be ice in varying degrees of slipperiness upon the pavement. Occurrences of this type might happen to people of any degree of ascendance or submission, or under various degrees of conformity-producing or biological pressure. They will tend to lower the proportion on the position of full compliance with the rule, and may in some cases tend to flatten the distribution. If there were no pressure of any kind exerted to make people come to church at a certain time, there would be about an equal likelihood, other things being equal, for individuals to come at any moment of the day. This assumes, of course, a hypothetical situation in which there are no institutionalized times for waking, sleeping, eating, working, etc. Evidence of the simple chance factor is probably shown in the left-hand portion of Figure 7 A. Here we see the distribution of city employees who registered with the C. W. A. before any announcement was made that they must do so, hence before there was any incentive toward compliance with a rule or any standard through which individual differences in promptness could be expressed. We find that this left-hand portion of the distribution is flat. About as many persons had effective reasons for registering upon one day as upon another.

We are now ready to synthesize our analysis of the factors operative in fields of conforming behavior. Our theory is that *the double-*

*J-curve of conforming behavior plotted upon an empirical continuum is a summation of four component distributions, produced, respectively, by conformity-making agencies, common biological tendencies, personality differences, and chance.*

We may conceive the empirical scale units of the conformity distribution as capable of being reinterpreted in four different ways as the base lines, respectively, of these four component distributions. For example, the *empirical continuum* of time of factory arrival, with its successive five-minute intervals, can be converted, first, into a *telic* continuum, by combining its five-minute units into positions of "on time," and of increasing degrees of "lateness." Second, it can be employed as a *biological* continuum, by treating its units as indices of the degrees of energy required to overcome physiological inertias, or as the degrees of certain universal, organic drives. Third, it can be construed as indirectly measuring the degree of some trait in which individuals characteristically differ. That is, it may be used as a *personality-trait* continuum. And, fourth, its units may represent categories into which, other influences being equal, behavioral occurrences might fall by *chance*. Suppose now that these four tendencies (conforming, biological, personality, and chance) were to act alone, or could be theoretically isolated in their distributional effects. We might then plot the distributions produced by each in a separate graph. And since all four graphs would have the same empirical continuum as their base line, they could be mathematically combined. Such a theoretically combined distribution would then be that which we might expect to discover if we were to go out (as we did in the case of the figures in our charts) and record the actual behaviors of individuals.

We have as yet no mathematical equations for such curves, nor any formula for the equilibrium of the forces which determine their modes. As a simple preliminary statement, we may say, however, that if  $F$  stands for force,  $b$  for common biological tendency,  $c$  for conformity-producing tendency, and  $p$  for the tendency toward distribution in a normal curve of personality traits (and omitting the chance factor since it operates equally in respect to all these tendencies), then (1) the horizontal position of the mode of the combined distribution, that is, its place on the  $x$  axis, will be the point at which

$$F_b - F_c = 0$$



where the biological and conformity-producing tendencies are working in the opposite direction, and it will be determined by the summation

$$F_b + F_c$$

where these tendencies are working in the same direction; and (2) the height of the mode, that is, the position of its apex on the vertical or  $y$  axis, will be determined by the point where

$$F_p - (F_b + F_c) = 0$$

In conclusion, we may illustrate our theory by reference to a similar distribution in nature, namely, that of the grains of sand in a sand dune. The shape of a dune results from the combining of a number of forces, in the same way that our curves of conforming behavior combine the distributions of the several tendencies we have described. This illustration, of course, is not intended as an analogy between societal formations and a sand dune, but simply as a statement of the operation of similarly combined principles. The form of a sand dune, seen in cross section, like the form of our conformity distributions, is asymmetrical. It has a gentle slope on the windward side, and a steeper slope on the leeward side. On the windward side there are two forces operating, namely, the wind, which acts in a horizontal direction, and gravitation, which acts in a vertical direction. Sand particles are blown up the windward slope, and, when they pass the crest, are sheltered from the wind and hence are acted on by gravitation alone. This process is similar to the situation where a conformity-producing tendency (comparable to the wind) is acting to make people come to church at a certain time, and there is also a resistance (comparable to gravitation) due to biological inertia. The latter factor tends to lower conformity because of the effort required for compliance with the rule. Now when we pass the crest (mode) of our curve toward the left, we find only individuals who are on time or ahead of time; that is, the tendency of biological inertia was not strong enough to make them be late, just as gravitation was not strong enough to keep certain sand grains from being blown over the top of the dune. Nevertheless, once they are on the leeward side, that is, "on time," the conformity-producing tendency is no longer a factor in determining the position



of these individuals along the scale. Biological inertia acts alone in this capacity. In both cases the tendency is to make the distribution as steep as possible. Just as the sand grain takes the shortest line possible to the ground, so people tend not to come to church any earlier than they need to.

Now the crest of the dune is the point of equilibrium between these two forces, gravitation and wind. Particles which are just about to fall over the edge are equally acted upon by both forces, and this equilibrium determines the point of the crest. Similarly, the apex of our behavior distributions represents the point where the conformity-producing and the biological forces are equal. This point will mark the piling-up of the greatest number of cases, just as the dune's height is greatest at this point.<sup>19</sup>

But let us go a little further. If wind and gravitation were the only factors operative, and if the wind were strong enough, it would overcome gravitation and blow the sand up into a straight vertical plane. If gravitation were very strong in comparison with the force of the wind, the wind might not disturb the sand at all. In this case the sand would lie in a flat, horizontal plane. There is usually present, however, some obstruction, such as a boulder, which starts the process of dune building; some object, in other words, which will give a differential in the relative effect of wind and gravitation. On one side the obstruction helps the wind prevail over gravitation as a dune-building agency by providing an inclined plane upon which the sand may rest as it is being blown horizontally and upward. On the other side the obstruction helps gravitation to become the more characteristic influence in constructing the dune's profile by not only sheltering the sand particles on that side from the wind, but by providing again an inclined plane down which the particles can roll. Consequently we do not have (as a result of wind action and gravitation) either a vertical or a horizontal plane, but a doubly sloping mound resulting from a differential between the two forces produced by a third factor and expressing a compromise between them.

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<sup>19</sup>We must recognize a contrast, however, in the shape of this apex. The conformity curve possesses positive acceleration toward the mode; that is, its apex is high and sharp, while the crest of the dune is rounding, or negatively accelerated. This difference is probably due to the psychological factors (learning, social facilitation, suggestion, etc.), which operate in the conformity situation.

The situation is similar with human beings who are acting under conformity-producing and biological influences. There is not a complete subservience either to the one influence or to the other, but a compromise between them owing to a differential which has been established. This differential arises from the tendencies of behavior characteristic of the individuals concerned. Personality differences are the materials already present, just as the boulder at the foundation of the sand dune is present before the dune is formed. On the right side, by providing individuals who by nature do not go "far enough," the personality curve aids the conformity-producing factor as the stronger tendency in building the diminishingly non-conforming part of the distribution. On the left side, by providing individuals who characteristically do *more than* is expected, it not only makes the conformity-producing agency irrelevant upon that side, but works with the biological tendency in producing the diminishingly "more than conforming" part of the distribution. Hence the resulting total pattern is neither completely horizontal nor completely vertical, but tapers off on both sides in the same manner as the sand dune.

We thus see that distributions of behavior in conformity situations are similar in form to such natural objects as sand dunes, waves, and snow drifts, and for precisely the same reason. Regularities are found as truly in the field of human behavior as in the fields of physics or geology, so far as the components of action and their statistical summation are concerned. Our present hypothesis is directed toward a quantitative formulation of these components and an understanding of their operation according to a definite law.

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## L'HYPOTHESE DE LA COURBE J DU COMPORTEMENT CONFORMANT

(Résumé)

En considérant la conformité du comportement humain, les étudiants de la société se sont intéressés généralement à la "norme", c'est-à-dire, à l'acte fait par la plupart des gens. Cet article appuie sur l'importance d'étudier la distribution entière, y compris les degrés de la conformité partielle, ainsi que ceux de la non-conformité. On recommande deux continua de mesure. Le premier est le continuum *télique*, sur lequel sont projetées les déviations de l'acte modal lesquelles expriment son but à des degrés variants. Un exemple est le degré de ralentissement des chauffeurs d'automobile en s'approchant d'un signal rouge d'arrêt, ou le degré de salutation des membres d'église en s'asseyant sur leurs bancs. Le second continuum est *empirique*, et est basé sur des unités objectives et physiques du temps, de l'espace, etc. Tout au contraire du continuum télique, il permet la distribution séparée de ces cas de ceux qui "font plus que de conformer." Un "champ de comportement conformant" est défini comme une situation où la moitié (ou plus) des individus font l'acte qui satisfait une règle établie pour remplir un but défini. On a noté les comportements des individus en treize situations institutionnelles ou de conformité (politiques, économiques, et religieuses).

On suggère les généralisations suivantes: (a) *Dans un champ de comportement conformant, les variations du rendement, quand on les exprime sur leur continuum télique approprié variant d'une conformité complète à la règle à une déviation reconnaissable maximum, sont en forme d'une courbe d'accélération positive.* (b) *Dans un champ de comportement conformant, les variations du rendement, quand on les exprime sur un continuum empirique, sont en forme d'une courbe raide, non modale, double J, laquelle est ordinairement asymétrique en aire et portée.*

En interprétant les distributions de la conformité, on a reconnu quatre influences composantes: *Les tendances qui produisent la conformité (institutionnalisantes), les tendances ordinaires biologiques, les tendances à la distribution normale des traits de personnalité, et le hasard.* Les deux premières rendent plus raide la distribution à la mode, et déterminent la position modale. Elles sont opposées par les deux dernières influences, que tendant à baisser la mode et à étendre la distribution, expliquant ainsi la "queue" du J. On suggère, comme illustration, que ces influences travaillent ensemble pour produire la distribution empirique de conformité, à peu près comme les "forces de la nature" se combinent pour construire une dune de sable.

ALLPORT

## DIE J-KURVE-HYPOTHESE DES GLEICHFÖRMIGEN VERHALTENS

(Referat)

Hinsichtlich des gleichförmigen menschlichen Verhaltens haben sich die Soziologen im allgemeinen für die Norm interessiert, d. h. für den Akt, den die meisten Leute ausführen. Dieser Artikel legt viel Wert auf die Untersuchung der ganzen Verteilung, die auch Grade von Teilgleichförmigkeit oder Ungleichförmigkeit enthält. Zwei messbare Kontinua werden empfohlen. Das erste ist das teleologische Kontinuum, auf das die Abweichungen von dem modalen Akt, der seinen Zweck in verschiedenen Graden äussert, projiziert werden. Ein Beispiel davon ist der Grad des Bremsens von den Autofahrern beim roten Verkehrslicht, oder der Grad der Verbeugung der Kirchgänger beim Sichsetzen. Das zweite ist ein empirisches Kontinuum, und beruht auf objektiven, physikalischen Einheiten von Zeit, Raum, usw. Ungleich dem teleologischen Kontinuum gestattet es die getrennte Verteilung von denjenigen Fällen, die "mehr als gleichförmig" sind. Ein "Feld von gleichförmigem Verhalten" wird als eine Situation bezeichnet, wo die Hälfte (oder mehr) der Individuen den Akt ausführen, der einer Regel zur Vollziehung eines bestimmten Zweckes folgt. Die Verhaltensweisen von Individuen in dreizehn Gleichförmigkeitssituationen (politischen, ökonomischen, religiösen) wurden untersucht.

Die folgenden Verallgemeinerungen dürfen aufgestellt werden: (a) In einem Feld von gleichförmigem Verhalten nehmen die Variationen im Verhalten, wenn sie in eine passende teleologische Verteilung von vollkommener Gleichförmigkeit mit der Regel bis zu einer erkennbaren Maximalabweichung gebracht werden, die Form einer Kurve von positiver Beschleunigung an. (b) In einem Feld von gleichförmigen Verhalten nehmen die Variationen im Verhalten, wenn sie in eine empirische Verteilung gebracht werden, die Form einer steilen, unmodalen "Doppel-J-Kurve" an, die gewöhnlich asymmetrisch an Flächeninhalt und Umfang ist.

Bei der Deutung der gleichförmigen Verteilungen sind vier zusammengesetzte Einflüsse erkannt worden: gleichförmigkeitserzeugende Tendenzen, allgemeine biologische Tendenzen, Tendenzen nach einer normalen Persönlichkeitsverteilung, und Zufall. Die beiden ersten machen die Verteilung bei dem grössten Häufigkeitswert steil und bestimmen die modale Stellung. Sie stehen den zwei letzten gegenüber, welche den grössten Häufigkeitswert niedrig zu machen und die Verteilung auszubreiten neigen, wodurch der "Schwanz" des J erklärt wird. Es wird vorgeschlagen, dass diese Einflüsse zusammenwirken, um die empirische gleichförmige Verteilung zu erzeugen, ganz wie die "Naturkräfte" sich zusammensetzen, um die Dünen zu bauen.

ALLPORT



# THE IMBRICATION OF TESTS OF INTROVERSION-EXTROVERSION AND NEUROTIC TENDENCY\*

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During the past decade a great deal of work has been done by American psychologists in attempting to quantify the concepts of introversion and extroversion which were formulated by Jung (11). During this period, Jung's original concept of a libido which was expressed either inwardly, within the individual (introversion), or outwardly, toward other persons or objects (extroversion), has been greatly modified. There seems, however, to be no general agreement at present concerning the proper definition of the concepts or concerning the symptoms thereof.

In their review of the definitions which have been given for the terms, Guilford and Braly (8) concluded that the various definitions which have been advanced appear to have intellectual, emotional, and social aspects, and that in the various definitions these aspects play rôles varying in importance from none to very great. Furthermore, several studies have shown that the correlation between the various tests which have been constructed tend to be so low that the question whether they were all attempts to measure the same underlying trait has been seriously raised. One of the major purposes of the present study is to determine whether there is a general factor common to such tests.

Quite independent of these attempts to measure introversion-extroversion, there has been developed a series of tests which have been entitled tests of "neurotic tendency." The best known of these have been constructed by Woodworth (see 5), Cady (3), Mathews (14), Laird (12), Thurstone and Thurstone (18), and Bernreuter (2). All of them are outgrowths of the first one, that of Woodworth. The Woodworth test was constructed during the World

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War as a device for "spotting" those men who were emotionally unfit for warfare.

It has been quite generally assumed that the trait measured by these neurotic tendency tests is relatively independent of introversion. Laird (12, 13) constructed two separate tests, one for each of these traits; Bernreuter (2) provided two separate scoring scales for the Personality Inventory for these traits. Numerous studies have been reported in which tests bearing the different titles have been treated as measures of relatively independent traits. There have been, however, occasional critics of this procedure.

Conklin (4), for example, maintained that the available tests of introversion-extroversion were concerned with the "abnormal" aspects of the concepts and set himself the task of constructing a test for "normal" introversion-extroversion. Freud (6), furthermore, seems to make introversion a way-station on the road to neurosis by the statement, "An introvert is not yet a neurotic, but he finds himself in a labile situation; he must develop symptoms at the next dislocation of forces, if he does not find other outlets for his pent-up libido" (p. 325).

The very high correlations which have been found between the B1-N (neurotic tendency) scale and the B3-I (introversion-extroversion) scale of the Personality Inventory, which average .96 (2), led directly to the present study. The most reasonable interpretation of these high correlations seems to be that the two types of tests measure only a single trait, but that this fact has been obscured by the inadequacies of the tests which have previously been employed. In order to determine whether this interpretation is reasonable, the present study has been undertaken.

### THE EXPERIMENTAL PROCEDURE

In the present study, seven scales have been employed. Of these, five are entitled tests of introversion-extroversion, and two are entitled tests of neurotic tendency. The names of the tests, together with the symbols and abbreviations used in referring to them throughout this report, are shown in Table 1. Brief descriptions of the tests follow:

1. *The Root Test of Introversion-Extroversion* (16). The Root test consists of ten items, eight of which appear on the Ney-

TABLE 1  
TITLES, SYMBOLS, AND ABBREVIATIONS OF TESTS

Statistical symbol	Abbreviation	Test
1	R	Root Test of Introversion-Extroversion
2	C4	Colgate Personal Inventory C4
3	H	Heidbreder Test of Introversion-Extroversion
4	NK	Neymann-Kohlstedt Test of Introversion-Extroversion
5	B3-I	B3-I Scale of the Personality Inventory
6	W	Willoughby Personality Schedule
7	B1-N	B1-N Scale of the Personality Inventory

mann-Kohlstedt test, and three of which are similar to items on Whitman's C4 test. There are five possible responses for each item. The method of scoring used by Root has been somewhat simplified for use in the present study. The relationship between the two methods may be expressed by the formula

$$W = \frac{5-w}{2.5}$$

in which  $W$  is the weight used in the present study and  $w$  the weight used by Root. Scoring weights vary from 0 to 4, 0 being given to the most extrovertive response and 4 to the most introvertive. High scores are indicative of introversion, as is true with the other tests used. The correlation between the scores resulting from the use of the two methods is  $-1.00$ .

2. *Colgate Personal Inventory C4*. Whitman (19) revised the earlier Colgate Personal Inventory C2, which was prepared by Laird (13) in order to construct the C4 test. The C4 test differs from the C2 in that the C4 contains only ten items and is scored by means of a graduated scoring scale. The usual method of scoring was used.

3. *Heidbreder Test of Introversion-Extroversion*. The Heidbreder test (9) is composed of the 54 items which Freyd (7) collected and published as symptoms of introversion. The usual method of scoring was used.

4. *Neymann-Kohlstedt Test of Introversion-Extroversion* (15). The Neymann-Kohlstedt test was constructed on the assumptions that manic-depressive insanity is a typically extrovertive phenomenon and that schizophrenia is a typically introvertive phenomenon. The

items in the test were evaluated by being given to 100 manic-depressive cases and to 100 schizophrenics. For the purpose of the present study, the method of scoring the test was slightly modified in order to make positive scores indicative of introversion, as in the other tests used. This was done by subtracting the number of extrovertive answers from the number of introvertive answers, instead of the reverse which was the method used by the authors of the scale. The scores obtained by the two methods correlate to the extent of  $-1.00$ .

5. *B3-I Scale of the Personality Inventory* (2). The B3-I scale was constructed by evaluating the items of the Personality Inventory in terms of criterion groups selected by means of the Colgate Personal Inventory C2. The usual method of scoring was used.

6. *Willoughby Personality Schedule* (20). The Willoughby neurotic inventory represents a revision of the Thurstone and Thurstone (18) neurotic inventory. It comprises 25 items, which are scored by means of a graduated scale. The usual method of scoring was used.

7. *B1-N Scale of the Personality Inventory* (2). The B1-N scale was constructed by evaluating the items of the Personality Inventory in terms of criterion groups selected by means of Thurstone and Thurstone's neurotic inventory (18). The usual method of scoring was used.

### THE NATURE OF THE GROUP OF SUBJECTS

The subjects consisted of 157 first-year men engineering students who were taking an introductory course in applied psychology. The class was instructed in four sections, with from 36 to 50 students in each. The tests were administered during the regular class periods, all within the space of a week. The order in which the tests were presented varied from section to section, as did the number given on any one day.

Table 2 shows the means and standard deviations of the scores for each of the tests. In constructing the college norms for the Personality Inventory, on 427 men from various departments of various universities, the present writer found the means and standard deviation of scores on the B1-N and B3-I scales shown in Table

TABLE 2  
THE MEANS AND STANDARD DEVIATIONS OF SCORES ON EACH TEST

Test	Mean	Standard deviation
R	19.0*	4.66*
C4	20.5	4.11
H	-20.9	11.49
NK	23.0†	4.73
B3-I	-52.3	45.87
W	24.9	11.87
B1-N	-90.7	74.63

\*In terms of Root's scoring method,  $M = -42.5$  and  $S.D. = 11.65$ .

†In terms of Neymann-Kohlstedt's scoring method,  $M = -23.0$ .

TABLE 3  
THE MEANS AND STANDARD DEVIATIONS OF B1-N AND B3-I SCORES OF THE  
NORM GROUP OF COLLEGE MEN  
 $N = 427$

Scale	Mean	Standard deviation
B1-N	-52.9	85.2
B3-I	-27.4	51.6

3. A comparison of the values for these two scales given in Tables 2 and 3 indicates that the present experimental population earned, on the average, scores which indicate a greater degree of stability and extroversion than did the population on which the norms were constructed, and in addition that the dispersion of scores for the experimental group was less than for the norm group. This latter fact is of importance because the restricted dispersion has probably lowered somewhat all coefficients found in the present study.

## RESULTS

*The Reliability of the Tests.* The reliability of each test was computed through the use of the split-half, Spearman-Brown technique. Table 4 shows the results of these computations. Although the rather low reliability of the R, C4, H, and NK tests makes the interpretation of the raw correlations between the tests somewhat difficult, the reliability in each case appears to be high enough to warrant the use of the test in the present study.

*The Correlations between the Tests.* If the introversion tests

TABLE 4  
THE RELIABILITY OF THE TESTS BY THE SPLIT-HALF, SPEARMAN-BROWN  
TECHNIQUE

Test	Reliability
R	.59
C4	.54
H	.71
NK	.62
B3-I	.86
W	.86
B1-N	.88

were measuring one trait consistently, and if the tests of neurotic tendency were measuring another and different trait consistently, one would expect to find high intercorrelations among the introversion tests, and high among the neurotic tendency tests, with *low* correlations between the paired tests of introversion and neurotic tendency. Table 5, which shows the coefficients of correlation found between the tests, indicates that this expected condition does not hold. The median coefficient found among the introversion tests is .37; the median coefficient found between the tests of introversion and neurotic tendency is .40.

TABLE 5  
INTERCORRELATIONS

	R	C4	H	NK	B3-I	W
C4	.384					
H	.346	.444				
NK	.602	.248	.280			
B3-I	.281	.409	.553	.152		
W	.369	.422	.478	.220	.617	
B1-N	.298	.382	.514	.162	.952	.646

TABLE 6  
INTERCORRELATIONS, CORRECTED FOR ATTENUATION

	R	C4	H	NK	B3-I	W
C4	.682					
H	.532	.718				
NK	1.000	.437	.428			
B3-I	.394	.604	.709	.209		
W	.518	.623	.611	.306	.720	
B1-N	.411	.555	.658	.218	.952*	.742

\*This value is uncorrected for attenuation because, due to the nature of the Personality Inventory which was used in obtaining B1-N and B3-I scores, attenuation has not occurred to the customary extent.



Table 6, which shows the same coefficients of correlation after they have been corrected for attenuation, corroborates this finding. The median coefficient among the introversion tests is .57, while the median between the two supposedly different types of tests is .58. Although Tables 5 and 6 are open to various interpretations, it

TABLE 7  
COMPLETE LIST OF 105 TETRAD DIFFERENCES  
Italicized values are greater than  $5 \overline{PE}_t$

Tests <i>a, b, c, d</i>	<i>t<sub>abcd</sub></i>	<i>t<sub>abdc</sub></i>	<i>t<sub>acdb</sub></i>
1234	.022	— <i>.160</i>	— <i>.182</i>
1235	.071	.088	.017
1236	.038	.020	— <i>.018</i>
1237	.065	.065	— <i>.000</i>
1245	— <i>.188</i>	.011	— <i>.177</i>
1246	— <i>.170</i>	— <i>.007</i>	— <i>.163</i>
1247	— <i>.168</i>	— <i>.012</i>	.156
1256	.118	.086	— <i>.032</i>
1257	.258	.244	— <i>.015</i>
1267	.107	.122	.015
1345	.280	.026	— <i>.254</i>
1346	— <i>.212</i>	— <i>.027</i>	.184
1347	— <i>.253</i>	— <i>.027</i>	.226
1356	.079	.009	— <i>.070</i>
1357	.185	.165	— <i>.020</i>
1367	.034	.081	.047
1456	.310	.315	.006
1457	.528	.528	.000
1467	.329	.323	.006
1567	— <i>.170</i>	— <i>.002</i>	.167
2345	— <i>.070</i>	— <i>.047</i>	.023
2346	— <i>.021</i>	— <i>.021</i>	.000
2347	— <i>.056</i>	— <i>.035</i>	.011
2356	.078	.041	— <i>.038</i>
2357	.213	.211	— <i>.001</i>
2367	.070	.104	.034
2456	.063	.089	.026
2457	.170	.178	.008
2467*	.204	.189	— <i>.016</i>
2567	— <i>.138</i>	.029	.166
3456	.051	.100	.049
3457	.177	.188	.012
3467	.103	.068	— <i>.036</i>
3567	— <i>.191</i>	— <i>.053</i>	— <i>.138</i>
4567†	— <i>.111</i>	— <i>.002</i>	.110

\*This is the only instance in which the tetrad differences exceed  $5 \overline{PE}_t$ , without either Tests 1 and 4 or Tests 5 and 7 occurring simultaneously.

†This is the only instance in which the tetrad differences do not exceed  $5 \overline{PE}_t$ , when either Tests 1 and 4 or Tests 5 and 7 occur simultaneously.

seems certain that the traditional assignment of the term introversion to certain of the tests and of neurotic tendency to the others is unjustified.

*The Application of the Tetrad-Difference Technique.* In order to determine more adequately the natures of the relationships which exist between the various tests, the Spearman tetrad-difference technique (17) has been applied to the data of Table 5. The complete list of 105 tetrad differences is shown in Table 7. It is apparent at once that certain of these values vary from zero by considerable amounts. That they cannot be assumed to be merely chance variations from zero becomes evident when they are compared with the average probable error of the tetrad differences,  $\overline{PE}_t$ <sup>1</sup>, as shown in Table 8 for the tests 1234567, the complete list of tests.

TABLE 8  
AVERAGE PROBABLE ERROR OF THE TETRAD DIFFERENCES FOR  
SELECTED POOLS OF TESTS

Pools	$\overline{PE}_t$
1234567	.0275
12345	.0278
12356	.0277
12357	.0313
12367	.0275
23456	.0276
23467	.0285

TABLE 9  
TETRAD DIFFERENCES FOR TESTS 1, 2, 3, 4, 5; SHOWING A GROUP FACTOR  
BETWEEN TEST 1 AND TEST 4  
Italicized values are greater than 5  $\overline{PE}_t$

Tests <i>a, b, c, d</i>	<i>t<sub>abcd</sub></i>	<i>t<sub>abdc</sub></i>	<i>t<sub>acdb</sub></i>
1234	.022	— <i>.160</i>	— <i>.181</i>
1235	.071	.088	.017
1245	<i>.188</i>	.011	— <i>.177</i>
1345	<i>.280</i>	.026	— <i>.254</i>
2345	— <i>.070</i>	— <i>.047</i>	.023

<sup>1</sup>The formula used for computing  $\overline{PE}_t$  was that given by Holzinger (10, p. 16) as

$$\overline{PE}_t = \frac{1.349}{N} [\bar{r}^2 (1-\bar{r})^2 + (1-R) S^2]^{\frac{1}{2}}$$

Since the intercorrelations between the tests cannot be assumed to be due to the presence of one general factor, plus specific factors, the tests were taken in pools of five and their tetrad differences were studied. This was done for all possible combinations of five tests; Tables 9 to 14 present six of the pools. In Table 9 it is apparent that the six of the tetrad differences vary from zero by amounts greater than five times  $\overline{PE}_t$  (shown in Table 8), and that these occur when and only when Test 1 and Test 4 occur together. In each of the other pools in which Test 1 and Test 4 occur simultaneously the tetrad differences vary from zero by greater amounts than can be accounted for by chance. This is interpreted to indicate that a group factor exists between the Root and the Neymann-Kohlstedt tests, in addition to any possible general factor which they may be measuring.

In the same manner, Table 10 indicates the presence of a group

TABLE 10  
TETRAD DIFFERENCES FOR TESTS 1, 2, 3, 4, 5, 7; SHOWING A GROUP FACTOR  
BETWEEN TEST 5 AND TEST 7

Italicized values are greater than 5  $\overline{PE}_t$

Tests <i>a, b, c, d</i>	$t_{abcd}$	$t_{abdc}$	$t_{acdb}$
1235	.071	.087	.017
1237	.065	.065	.000
1257	.258	.244	— .015
1357	.185	.165	— .020
2357	.212	.211	— .001

factor between Test 5 and Test 7, the B3-I and B1-N scales. In each of the other pools in which Tests 5 and 7 occurred simultaneously, the tetrad differences were significantly greater than zero.

TABLE 11  
TETRAD DIFFERENCES FOR TESTS 1, 2, 3, 5, 6

Tests <i>a, b, c, d</i>	$t_{abcd}$	$t_{abdc}$	$t_{acdb}$
1235	.071	.088	.017
1236	.038	.020	— .018
1256	.118	.086	— .032
1356	.079	.009	— .070
2356	.078	.040	— .038

TABLE 12  
TETRAD DIFFERENCES FOR TESTS 1, 2, 3, 6, 7

Tests <i>a, b, c, d</i>	$t_{abcd}$	$t_{abdc}$	$t_{acdb}$
1236	.038	.020	— .018
1237	.065	.065	.000
1267	.107	.122	.015
1367	.034	.081	.047
2367	.070	.104	.034

TABLE 13  
TETRAD DIFFERENCES FOR TESTS 2, 3, 4, 5, 6

Tests <i>a, b, c, d</i>	$t_{abcd}$	$t_{abdc}$	$t_{acdb}$
2345	— .070	— .047	.023
2346	— .021	— .020	.000
2356	.078	.041	— .038
2456	.063	.089	.026
3456	.051	.100	.049

TABLE 14  
TETRAD DIFFERENCES FOR TESTS 2, 3, 4, 6, 7

Tests <i>a, b, c, d</i>	$t_{abcd}$	$t_{abdc}$	$t_{acdb}$
2346	— .021	— .020	.000
2347	— .056	— .035	.011
2367	.070	.104	.034
2467	.204	.189	— .016
3467	.103	.068	— .036

The comparison of Tables 11 to 14 with Table 8 shows that the intercorrelations between the tests may be accounted for by Spearman's two-factor theory whenever Tests 1 and 4 or Tests 5 and 7 do not occur simultaneously in the pools. These four are the only pools in which one or the other of these pairs does not occur. Table 8, in which the values which exceed  $5 \overline{PE}_t$  are italicized, gives the same information. In every instance, with but one exception, whenever Tests 1 and 4 or Tests 5 and 7 occur simultaneously the differences are greater than  $5 \overline{PE}_t$ ; in every instance, again with one exception only, the differences do not exceed  $5 \overline{PE}_t$  when one or the other of these pairs of tests do not occur.

On the basis of this analysis it seems reasonable to interpret the intercorrelations as indicating the presence of a general factor, plus specific factors, plus a group factor between the Root and Neymann-Kohlstedt test, plus a group factor between the B3-I and B1-N tests. Whether or not this general factor is the same as the general intellectual factor which Spearman has labeled "*g*" cannot be known from the data at hand, but it seems reasonable to assume that it is not. On the basis of this assumption and because of the possibility that this general factor is somehow related to emotional expression or control, it shall be tentatively termed the "*E*" factor and so referred to hereafter in the present paper.

*The Correlation of the Tests with E.* In order to find the extent to which the scores on the various tests are determined by the *E* factor, each test was correlated with *E*.<sup>2</sup> This was done separately for each test for each of the four pools of five tests in which the tetrad differences approximated zero. Table 15 presents these coefficients, together with the mean coefficients.

TABLE 15  
CORRELATION BETWEEN EACH TEST AND *E*

Pools	R	C2	H	NK	B3-I	W	B1-N
12356	.493	.625	.705		.700	.738	
12367	.503	.613	.688			.751	.711
23456		.611	.741	.320	.712	.723	
23467		.600	.723	.326		.744	.700
Mean	.498	.612	.714	.323	.706	.739	.706

The four tests W, H, B3-I, and B1-N correlated about equally well with *E*; the coefficient for W being .03 greater than for the other three. The correlation between C4 and *E* was .10 lower, but was still moderately high, being .62. The scores on the R test, which showed a correlation of .50, and those on the NK, which showed .32, are determined by *E* to a considerably smaller extent.

*The Correlation of Pools of Weighted Tests with E.* The amount of correlation with *E* that can be obtained by pooling and

<sup>2</sup>This was done through the use of the formula:

$$r_{ue} = \left( \frac{r_{ua}r_{ub} + r_{ua}r_{uc} + r_{ua}r_{ud} + r_{ub}r_{uc} + r_{ub}r_{ud} + r_{uc}r_{ud}}{r_{ab} + r_{ac} + r_{ad} + r_{bc} + r_{bd} + r_{cd}} \right)^{\frac{1}{2}}$$

See Holzinger (10, p. 18).



TABLE 16  
THE CORRELATION OF POOLS OF WEIGHTED TESTS WITH *E*

Pool	<i>r</i>
12356	.897
12367	.898
23456	.896
23467	.894

weighting various tests is shown in Table 16. Apparently there is no significant difference between the pools. However, because the R test can be given and scored more quickly than the NK, either the 12356 or the 12367 pool might be preferable to the others.

*The Relative Practicability of the Various Tests.* The two principal criteria whereby tests are usually selected for practical use are those of reliability and validity. In order to bring together the data on these two criteria which have been found in the present study, Table 17 is presented; it was prepared by selecting data from Tables 4 and 15.

TABLE 17  
THE RELATIVE PRACTICABILITY OF THE VARIOUS TESTS

Test	Reliability	Correlation with <i>E</i>
R	.59	.50
C4	.56	.61
H	.71	.71
NK	.62	.32
B3-I	.86	.71
W	.86	.74
B1-N	.88	.71

On the basis of these two criteria only, there seems to be little to choose between W, B3-I, and B1-N.<sup>3</sup> The H test, which correlates as highly with *E* as do these other three tests, appears to be appreciably less reliable than they. The three remaining tests do not appear to be sufficiently reliable or valid to justify their practical use in situations where the scores obtained for individual subjects are to be interpreted separately.

<sup>3</sup>However, on the basis of other criteria these tests do differ. The W test is shorter and easier to score than the other two. The B3-I and B1-N scales are parts of the Personality Inventory, which provides in addition a measure of self-sufficiency and dominance-submission.

## DISCUSSION OF THE RESULTS

In assigning the symbol "*E*" to the general factor which is indicated by the present study, it is fully recognized that the assignment is merely tentative. On the basis of the present study alone, the complete nature of *E* cannot be known. However, an inspection of the individual items on the tests, and particularly of the most heavily weighted items, shows that most of them refer principally to emotional aspects of behavior. Practically all of the items on the Willoughby test refer to emotional responses in social situations. The most heavily weighted items on the B1-N scale and B3-I scale refer principally to emotional conditions and seem to be about equally divided between social and non-social situations. The most diagnostic items on the Heidbreder test refer to both the social and emotional aspects of behavior. The Root and C4 tests are also composed of items which refer principally to these two aspects. Only the NK test, which shows the lowest degree of correlation with *E*, contains items which refer to the intellectual aspects of behavior. In view of this evidence, the assumptions that the *E* factor is closely related to the emotional life of an individual and that it is relatively independent of Spearman's "*g*" factor of intelligence seem to be reasonable.<sup>4</sup>

The relatively low reliability of the NK test and the low correlation between the NK test and *E* may result from the assumptions upon which the test was constructed. These were that schizophrenia is a typically introvertive phenomenon, that manic-depressive insanity is a typically extrovertive phenomenon, and that criterion groups for the evaluation of test items should be composed of clinically diagnosed cases of psychotic individuals. There seems to be little logical or experimental justification for the assumption that manic-depressive insanity is an extrovertive phenomenon; certainly the test constructed on the basis of this and the other mentioned assumptions is less practicable than are the other available

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<sup>4</sup>Further experimentation, now under way at the Pennsylvania State College Psycho-Educational Clinic under the direction of the present writer, is directed toward the more complete understanding of the nature of the *E*-factor. These investigations are directed toward determining what psychological and physiological factors are characteristic of groups of individuals who possess large and small amounts of *E*. Work already undertaken by Professor Walter R. Miles and Dr. L. P. Herrington, of the Institute of Human Relations, Yale University, indicates that the rate of basal metabolism is probably closely associated with the *E* factor.

tests. So far as reliability is concerned, the NK test, which is composed of 50 items, was found to be .09 lower in reliability than the H test which is composed of 54 items, and to be only .03 higher than the R and only .06 higher than the C4 tests which are composed of 10 items each. The W test, which is composed of only 25 items, was found to be .24 higher in reliability than the NK. Furthermore, the low correlation between NK and *E* indicates that the NK test is considerably less valid than are the other tests.

However, two further considerations must be noted. The first is that the reliability of the test might be improved if more care had been used in selecting the items; the other is that the NK test may be a measure of some trait other than *E*. If the latter is true, as it may well be, it would indicate that the continuum which lies between schizophrenia and manic-depressive is not the same as that which lies between introversion and extroversion, and that an error was made in naming the NK test a test of introversion-extroversion.

The fact that group factors are indicated between two pairs of the tests used in the present study also requires consideration. Root (16) mentions the fact that eight out of the ten items on his test duplicate items which occur on the 50-item NK test. This very great degree of similarity of content probably accounts for the group factor found between the two. The other group factor, between B1-N and B3-I, may be due to similarity in the items or may be due to the fact that the coefficient of correlation found between the two tests has not been attenuated to the extent that the other intercorrelations have. It is recognized that attenuation usually results from the influence of irrelevant chance factors which affect the scores (on the two tests which are being correlated) in an uncorrelated manner. On the Personality Inventory, however, because only a single list of items is used for all scales, such chance factors affect the scores in a *correlated* manner to an extent dependent upon the correlation between the weight of the items, hence the amount of attenuation is less than would usually result from such chance factors.<sup>5</sup>

#### SUMMARY

1. The purpose of the present study was twofold: to determine whether, despite the low intercorrelations which have been obtained,

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<sup>5</sup>For a further discussion of this point see (1).

the various tests of introversion-extroversion are all measures of the same trait, and if so, whether tests of neurotic tendency are also measures of this trait.

2. Five introversion-extroversion tests, those prepared by Root, Heidbreder, Neymann-Kohlstedt, Whitman, and Bernreuter, and two neurotic tendency tests, those by Willoughby and Bernreuter, were used.

3. The subjects were 157 first-year men engineering students. As a group they were more homogeneous, as indicated by the standard deviation of the scores, than an entirely random sampling of college students.

4. Both the raw coefficients of intercorrelation and those corrected for attenuation showed that there was, on the average, a somewhat closer degree of relationship between the neurotic tendency tests and the introversion-extroversion tests than there was between just the introversion-extroversion.

5. The application of the Spearman tetrad-difference technique indicated the presence of a general factor, plus specific factors, plus a group factor between the Root and Neymann-Kohlstedt test, plus a group factor between the B1-N and B3-I scales.

6. There appears to be no justification for continuing to call some tests introversion-extroversion tests and the others tests of neurotic tendency. Such a procedure implies the existence of two separate traits; the present study discloses the existence of one trait, common to all of the tests.

7. The general factor, disclosed by the present study, is referred to as the *E*-factor. This appears to be reasonable since an inspection of the most significant items of the various tests indicates that they refer principally to emotional responses and only secondarily to social aspects of behavior. The part played by intellectual aspects of behavior seems to be minor.

8. The group factor between the Root and Neymann-Kohlstedt tests appears to be due to the high degree of similarity between their content. The group factor between the B1-N and B3-I scales appears to be due to the similarity of content and to the fact that attenuation due to irrelevant chance factors has not occurred to the same extent as with the other tests.

9. The correlations between the various tests and the *E*-factor vary from .32 to .74.



10. The best weighted pool of tests shows a correlation with the *E*-factor of .90.

11. The several tests vary considerably in practicability, as judged by their reliability and degree of correlation with the *E*-factor.

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## L'IMBRICATION DES TESTS D'INTROVERSION-EXTROVERSION ET DE TENDANCE À LA NEVROSITE

(Résumé)

On a fait subir cinq tests d'introversion-extroversion, ceux de Root, de Heibreder, de Neymann-Kohlstedt, de Whitman et de Bernreuter, et deux tests de tendance à la névrosité, ceux de Willoughby et de Bernreuter, à 157 étudiants de première année d'une école polytechnique. On a trouvé un degré de relation un peu plus grand entre les tests de tendance à la névrosité et les tests d'introversion-extroversion qu'entre les tests d'introversion-extroversion seuls. L'application de la technique de Spearman de différence de tétrades a indiqué la présence d'un facteur général, plus des facteurs spécifiques, plus un facteur collectif entre les tests Root et Neymann-Kohlstedt, et plus un facteur collectif entre les tests Bernreuter. Le facteur général est appelé pour le moment le facteur E parce que les points les plus significatifs des divers tests se rapportent principalement aux réponses émotives. Les facteurs collectifs semblent dus au haut degré de similarité de contenu et, au cas des tests Bernreuter, au fait que l'atténuation due aux facteurs étrangers du hasard ne s'est pas montrée au même degré que dans les autres tests. Les corrélations entre les divers tests et le facteur E varient de 0,32 à 0,74. Les divers tests varient considérablement au point de vue pratique, jugés par leur constance et le degré de corrélation avec le facteur E. Le groupe de tests le mieux équilibré donne une corrélation de 0,90 avec le facteur E.

BERNREUTER

## DAS ÜBERGREIFEN DER TESTS VON INTROVERSION-EXTRAVERSION UND NEUROTISCHER NEIGUNG

(Referat)

Fünf Tests von Introversion-Extraversion (Root, Heibreder, Neymann-Kohlstedt, Whitman, und Bernreuter) und zwei Tests von neurotischer Neigung (Willoughby und Bernreuter) wurden 157 Studenten des Ingenieurwesens gegeben. Ein etwas grösseres Verhältnis fand sich zwischen den Tests der neurotischen Neigung und den Tests für Introversion-Extraversion als zwischen den Tests für Introversion-Extraversion allein. Die Verwendung von der Spearman Vierzahlunterschiedsmethode wies einen allgemeinen Faktor, spezifische Faktoren, einen Gruppenfaktor zwischen den Root und Neyman-Kohlstedt Tests, und einen Gruppenfaktor zwischen den Bernreuter Tests auf. Der allgemeine Faktor wird vorläufig als den E-Faktor bezeichnet, weil die bedeutendsten Einzelheiten der verschiedenen Tests sich hauptsächlich auf die affektiven Antworten be-

ziehen. Die Gruppenfaktoren scheinen einen hohen Grad von Aehnlichkeit und Inhalt zu besitzen, und in Bezug auf die Bernreuter Tests zeigte sich, dass die Verdünnung wegen unwesentlicher Zufallfaktoren nicht in demselben Grade geschehen ist, wie bei den anderen Tests. Die Korrelationen zwischen den verschiedenen Tests und dem E-Faktor variieren von ,32 bis ,74. Die verschiedenen Tests variieren bedeutend an Zweckmässigkeit ihrer Gültigkeit und dem Grade der Korrelation mit dem E-Faktor nach. Die beste Gruppe von Tests zeigte eine Korrelation von ,90 mit dem E-Faktor.

BERNREUTER

# ATTITUDES OF UNDERGRADUATE STUDENTS\*

*From the Psychological Laboratory of the University of Chicago*

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HILDING B. CARLSON

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This paper is a report of a study<sup>1</sup> of (1) attitudes of senior students in the University of Chicago toward prohibition, God, pacifism, communism, and birth control, (2) the relation between intelligence of undergraduates and their attitudes on these questions, and (3) the inter-relation of these attitudes. A fourth phase of the study was to find out whether undergraduates in different divisions of study differ markedly in their attitudes toward these social questions.

The experimental data were collected during the school year 1931-32. The attitude scales used were developed by Professor L. L. Thurstone and associates. Inasmuch as the technique for the construction of these scales is described in "The Measurement of Attitudes," by L. L. Thurstone and E. J. Chave, it need not be described here. Each scale consists of 20 or 22 statements which express gradations of thought and feeling from one extreme to another. Each statement has a determined scale value. The subject is asked to put a check mark if he agrees with the statement, to put a cross if he disagrees with the statement, and to put a question mark if he cannot decide about any particular statement. A subject's score is the median scale value of all the statements that he endorses.

Five hundred sets of these five attitude scales were distributed to seniors in the University of Chicago. The experiment was limited to seniors in order (1) to prevent the possible influence that differences in educational level among the subjects might have on the results, and (2) to obtain the maximum effects of any possible differences in attitude as a consequence of study in different divisions of the University. Because the filling-out of the scales was optional, it is possible that thereby a selective factor was introduced unwittingly; that is, the 215 seniors who returned completed forms might be

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<sup>1</sup>The author is indebted to Professor L. L. Thurstone for his guidance and aid throughout the development of this experiment.

more socially minded than those who failed to return the scales. However, we have assumed that these seniors are representative of the entire senior population for we have no information that leads us to believe otherwise.

The distribution of the scores on each of the scales for all seniors, irrespective of divisional classification, is shown in Table 1.

TABLE 1  
FREQUENCY TABLE OF SCORES ON EACH OF THE SCALES

Class interval	Prohibition	God	Pacifism	Communism	Birth control
10.5-11.0					
10.0-10.5					
9.5-10.0		1			
9.0- 9.5			2		2
8.5- 9.0		8	11	1	1
8.0- 8.5	8	28	30	1	51
7.5- 8.0	1	23	37	11	103
7.0- 7.5	18	18	64	19	28
6.5- 7.0	7	20	25	20	8
6.0- 6.5	12	11	17	23	4
5.5- 6.0	13	24	10	41	4
5.0- 5.5	11	5	10	39	1
4.5- 5.0	14	14	7	23	
4.0- 4.5	23	16	2	11	1
3.5- 4.0	62	15		11	4
3.0- 3.5	23	20		9	3
2.5- 3.0	20	6		4	3
2.0- 2.5	2	6		2	2
1.5- 2.0	1				
1.0- 1.5					
.5- 1.0					
.0- .5					
Mean=	4.57	5.88	7.12	5.55	7.35
S.D.=	1.54	1.89	1.01	1.26	1.21

( $N = 215$ . The lower the numerical value of the score, the more unfavorable is the subject's attitude toward the object of the scale; the higher the numerical value of the score, the more favorable is the subject's attitude toward the scale object.)

*Attitude of Seniors toward Prohibition.* Seniors differ considerably among themselves in their attitude toward prohibition; the majority, however, is opposed to prohibition. The mean score for the entire group is 4.57. This value is representative of such an opinion

in the scale as "The benefits of prohibition do not warrant the cost of enforcing it."

*Attitude of Seniors toward the Reality of God.* There is greater ambiguity of opinion toward the reality of God than there is in any other issue. The mean score for the group is 5.88, which can be interpreted by such an opinion as "I think I believe in God, but really I haven't thought much about it." However, because the distribution of scores is irregular rather than normal, this more or less neutral statement does not give a fair example of the typical attitude of seniors toward God. The somewhat bimodal distribution perhaps should be interpreted as indicating that the undergraduates have more or less definite attitudes toward God, either favorable or antagonistic, instead of the indifferent attitude indicated by the mean score.

*Attitude of Seniors toward Pacifism.* The students are almost unanimously sympathetic toward pacifism. The distribution is fairly normal, with the mean at 7.12. This score represents such an opinion as "An organization of all nations is imperative to establish peace."

*Attitude of Seniors toward Communism.* The distribution of scores on the scale toward communism is quite normal with the mean score at 5.55. This mean score may be interpreted by such an opinion as "Communism would not make much difference in the long run." There are relatively few seniors who are either extremely in favor of communism or antagonistic toward it.

*Attitude of Seniors toward Birth Control.* The distribution of scores for the scale on attitude toward birth control is bimodal with a distinct break at 4.75. The mean score for the large group in favor of birth control, 7.53, is representative of such an opinion as "Birth control is a legitimate health measure," while the mean score for the small group opposed to birth control, 3.13, can be interpreted by such an opinion as "Birth control is morally wrong in spite of its possible benefits."

*Comparison of Attitudes of Men and Women.* Table 2 shows the comparison of the mean scores between men and women in their attitude toward prohibition, God, pacifism, communism, and birth control. The differences between the mean scores for men and women are statistically significant only in regard to attitude toward prohibition and toward the reality of God. Men are more opposed to prohibition than are women, and believe less in the reality of God than do



TABLE 2  
MEAN ATTITUDE SCORES FOR MEN AND WOMEN

Attitude scale	Men	Women	Diff.	P.E. <sub>diff.</sub>	Diff.
					P.E. <sub>diff.</sub>
Prohibition	4.13	4.81	.50	.139	3.60
God	5.53	6.22	.69	.179	3.85
Pacifism	7.06	7.17	.11	.065	1.69
Communism	5.60	5.50	.10	.082	1.22
Birth control	7.37	7.33	.04	.079	.51

women. The finding in regard to attitude toward the reality of God is somewhat substantiated by previous investigators; Leuba (4), Lundberg (5), and Jones (3) report that women are distinctly more conservative than are men on religious questions.

*Comparison of Attitudes of Seniors in the Divisions of the University of Chicago.* The question was raised at the beginning of the study as to whether or not students in different divisions of the University of Chicago differ in their attitudes on various social questions; that is, are students in social sciences more liberal or radical in their attitudes on social questions than students in physical sciences? The question, of course, immediately arises as to what is to be considered liberal or conservative. Throughout this study, an individual will be considered to be conservative if he adheres to the existing order of things and if he opposes change of that order. Inasmuch as the majority of people apparently believe in the reality of God, a person who believes in the reality of God can be considered conservative. Similarly, a person can be considered conservative if he is friendly to prohibition, or opposed to pacifism, to communism, or to birth control. On the other hand, an individual can be considered either radical or liberal if he does not believe in the reality of God, or if he is favorable to pacifism, or communism, or birth control, or if he is opposed to prohibition. As can be inferred from Table 3, the differences among undergraduates in the four divisions in their attitude toward prohibition, God, pacifism, communism, and birth control are not very great in any instance. Inasmuch as students in physical sciences are frequently considered to be most conservative and those in social sciences most liberal or radical, the discussion will be limited to a consideration of the differences between the mean scores

TABLE 3  
MEAN ATTITUDE SCORE OF UNDERGRADUATES IN EACH DIVISION

Division	Prohi- bition	God	Paci- fism	Com- munism	Birth control
Physical sciences	4.54	6.15	6.84	5.21	7.16
Humanities	4.61	5.83	7.14	5.76	7.25
Biological sciences	4.40	5.75	7.17	5.28	7.45
Social sciences	4.61	5.83	7.26	5.72	7.51

of undergraduates in these two divisions. The differences are shown in Table 4.

Undergraduates in physical sciences are not as favorable to pacifism and to communism as are those in social sciences. The same conservative trend is present among the undergraduates in physical sciences in their attitude toward birth control and toward God, although this trend is not marked enough to be statistically significant. While the differences among undergraduates in physical sciences and

TABLE 4  
MEAN ATTITUDE SCORES OF UNDERGRADUATES IN PHYSICAL SCIENCES AND IN SOCIAL SCIENCES

Attitude scale	Physical sciences	Social sciences	Diff.	P.E. <sub>diff.</sub>	Diff. P.E. <sub>diff.</sub>
Prohibition	4.54	4.61	.07	.115	.61
God	6.15	5.83	.32	.240	1.30
Pacifism	6.84	7.26	.42	.129	3.26
Communism	5.21	5.72	.51	.159	3.21
Birth control	7.16	7.51	.35	.155	2.30

those in social sciences are not large, there is some justification for the assumption that students in physical sciences are somewhat more conservative in their attitude toward social questions than are those in social sciences.

*Attitude of Jewish, Protestant, and Catholic Seniors toward Prohibition, God, Pacifism, Communism, and Birth Control.* Table 5 shows the mean attitude scores for the Jewish, Protestant, and Catholic students. Jewish students are most opposed to prohibition, are most sympathetic to pacifism, communism, and birth control, and believe least in the reality of God. Catholic students believe most

TABLE 5  
MEAN ATTITUDE SCORES FOR JEWISH, PROTESTANT, AND CATHOLIC  
UNDERGRADUATES

Attitude scale	Jewish under- graduates	Protestant under- graduates	Catholic under- graduates
Prohibition	3.74	5.23	4.10
God	4.92	6.27	7.16
Pacifism	7.53	7.11	6.70
Communism	5.97	5.38	5.16
Birth control	7.75	7.45	6.64
<i>n</i> =	51	114	27

strongly in the reality of God, and are least sympathetic to pacifism, communism, and birth control. They are opposed to prohibition, but not as strongly as are Jewish students. Protestant students are least opposed to prohibition, but hold a position intermediate to Jewish and Catholic students in their attitude toward God, pacifism, communism, and birth control. In other words, Jewish undergraduates are most liberal or radical on these social questions, Catholic undergraduates are most conservative except on prohibition, while Protestant undergraduates are intermediate to Catholic and Jewish students except toward prohibition on which they are the most conservative. The differences are consistent and in most instances are large enough to be statistically significant, and indicate that the religious affiliation of a student is an important factor in the determination of his or her attitude on these social questions. The differences are more marked than are the differences found in regard to sex or school training. We might conclude, then, that an undergraduate's present religious affiliation, or his early religious training, may be a more important factor than the student's sex or later school training in determining his or her attitude on these social questions.

*The Relation between Intelligence and Attitude toward Prohibition, God, Pacifism, Communism, and Birth Control.* Of the 215 undergraduates who returned completed forms, 100 had taken the entrance psychological examination. Table 6 shows the correlations between the scores on this intelligence examination and the scores on each attitude scale. Apparently there is no correlation between intelligence and attitude toward prohibition. The correlations between intelligence scores and the scores on the scales on pacifism, communism, God, and birth control, while not high, indicate that

TABLE 6  
CORRELATIONS BETWEEN UNDERGRADUATES' SCORES ON INTELLIGENCE TEST AND  
THEIR SCORES ON ATTITUDE SCALES

Prohibition and intelligence	+.036	±.067
God and intelligence	-.191	±.065
Pacifism and intelligence	+.402	±.059
Communism and intelligence	+.330	±.060
Birth control and intelligence	+.211	±.064

there is a tendency for the more intelligent undergraduate to be sympathetic toward pacifism, communism, birth control, and atheism. The conclusion that more intelligent undergraduates are likely to have more liberal or radical attitudes on social questions than dull students coincides with the conclusions of most other investigators.

*Intercorrelations of Attitudes of Undergraduates toward Prohibition, God, Pacifism, Communism, and Birth Control.* It would be of considerable psychological interest if it could be demonstrated that individuals tend to be either liberal or conservative on most social questions. In order experimentally to determine this it would be necessary to know the attitudes of a group of people toward a large number of specific issues. Intercorrelation of these attitudes would then reveal whether or not members of the group were consistently either radical or conservative. Although this study does not consider more than five social questions, an attempt has been made to suggest the answer to this question by means of the above method. The correlations are listed in Table 7.

TABLE 7  
INTERCORRELATIONS OF ATTITUDES

	Birth control	Communism	Pacifism	God
Communism	.273±.043			
Pacifism	.248±.043	.391±.039		
God	-.324±.041	-.379±.040	-.270±.043	
Prohibition	-.070±.046	-.280±.042	-.030±.046	.269±.043

A cursory inspection of these intercorrelations seems to indicate that an individual who is radical on one issue is somewhat more likely to be radical than to be conservative on another social question, and vice versa. This conclusion falls in line with the assumptions of some writers and with the experimental results obtained by George (2), Folsom (1, p. 554), and Vetter (10). If markedly different inter-



relations had resulted, we might well have questioned them. For example, an individual who believes in the reality of God is likely to be a person who was, or who had at one time been, subjected to some form of religious or church influence. The leaders of many churches definitely discourage the practice of birth control among their members. They are also opposed to communism. An individual who attends church is likely to believe in the reality of God and is also likely to be antagonistic to communism and to birth control. On the other hand, the leaders of the communistic movement, at least as typified by those of the Soviet Union, are definitely committed to the encouragement of birth control and atheism. Accordingly, an individual who is sympathetic to communism might be expected to be sympathetic to birth control and to atheism. This agreement of the results found by the use of attitude scales with those of *a priori* reasoning based on common observation increases the degree of confidence that can be placed in the coefficients obtained.

If it is true that an individual who is radical on one issue is somewhat more likely to be radical than to be conservative on another social question, is it possible to consider attitudes as made up of a single general factor ( $g$ ), common to all attitudes of an individual, plus specific unrelated factors ( $s$ )? In order to determine whether such a common factor is present, Spearman's two-factor analysis has been applied. The tetrads thus obtained, however, are not numerically less than twice their probable errors, and the existence of such a common factor is not established. Apparently attitudes are too complex to be considered as due to a single common factor plus specific unrelated factors.

A further analysis of the intercorrelations was then made by means of a multiple-factor analysis. Making use of a technique developed

TABLE 8  
FACTOR LOADINGS

	I	II	III	$\Sigma h^2$
Prohibition	— .24	.49	.15	.32
God	— .56	.23	— .15	.38
Pacifism	.57	.27	— .07	.40
Communism	.70	— .11	— .25	.56
Birth control	.45	.01	.22	.25
Intelligence	.47	.34	— .09	.34
$\Sigma K^2$	1.61	.49	.17	



by Professor Thurstone, the three factors listed in Table 8 were obtained. By means of the loadings of each item in each factor, it is possible to reproduce, within experimental error, the correlations listed in Tables 6 and 7. In other words, these correlations act as if there were three factors operating to produce them. The relative importance of these factors is indicated by the sum of the squares of the loadings for each factor ( $\Sigma K^2$ ). These sums are included in Table 8. As can be seen, factor I is much more important than factor II, which in turn is more important than factor III. Apparently, this last factor is relatively unimportant in determining an individual's attitude toward any specific social question.

The relative weightings of the variables in a factor may give an indication of the psychological significance of the factor; that is, by noting the loadings of each item in a factor it may be possible to ascribe a name to the factor. In the first factor, intelligence and attitude favorable to communism, pacifism, and birth control are positively weighted, while attitude favorable to prohibition and God is negatively weighted. This might be called a general "radical-conservative" factor. In the second factor, intelligence and attitude favorable to prohibition, God, and pacifism are positively weighted, while attitude favorable to communism is negatively weighted. This second factor cannot be named as readily as can the first. The third factor does not make psychological sense.

It is possible that the psychological factors involved are obscured by reason of the small number of variables included in this study. Having determined the number of factors and the loadings of each variable in each factor, it is possible to shift the axes as much as we please. By so doing, it may be possible to obtain a set of loadings that will be of psychological significance. Table 9 shows the loadings of each item as a result of one such shift of the axes. The first axis is passed through "intelligence," the second axis through "communism," and the third axis is then determined. The first factor thus obtained is positively weighted with intelligence and with attitude favorable to pacifism, to communism, and to birth control, and negatively weighted with attitude favorable to God. This factor is named "intelligence." The second factor is found to be positively weighted with attitude favorable to communism, to birth control, and to pacifism, and negatively weighted with attitude favorable to God

TABLE 9  
FACTOR LOADINGS

	I	II	III
	Intelligence	Radical-conservative	Religious
Intelligence	.59	—	—
Communism	.53	.53	—
God	— .29	— .42	.35
Pacifism	.62	.10	— .06
Birth control	.33	.15	— .34
Prohibition	.06	— .56	.03

and to prohibition. This is interpreted as being a general "radical-conservative" factor. The third factor is positively weighted with attitude favorable to God and negatively weighted with attitude favorable to birth control. These loadings suggest a religious influence that remains unaccounted for by the first two factors.

Specific attitudes toward prohibition, God, pacifism, communism, and birth control seem to be due to three common factors, an intelligence factor, a general radical-conservative factor, and a religious factor. While this analysis is not to be considered as final in any sense of the word, it does indicate that further work along this line may prove very profitable.

### CONCLUSIONS

1. Seniors in the University of Chicago, on the average, are opposed to prohibition, sympathetic toward pacifism and birth control, and neutral toward communism and God.

2. Undergraduate women, on the average, are more favorable to prohibition and have a stronger belief in the reality of God than do undergraduate men. However, the two sexes do not differ markedly in their attitude toward pacifism, communism, and birth control.

3. Undergraduates in social sciences are slightly more favorable to communism and pacifism than are undergraduates in physical sciences. The results give some slight evidence in favor of the assumption that students in social sciences are more liberal in their attitudes on social questions than are students in physical sciences.

4. Of the undergraduates in the three major religious groups, Jewish, Protestant, and Catholic, Jewish students are most liberal

in their attitude on these social questions. Catholic students are least liberal, except toward prohibition, toward which Protestant undergraduates are least liberal.

5. Intelligence is not correlated with attitude toward prohibition, but is positively correlated with sympathetic attitudes toward communism, birth control, pacifism, and atheism.

6. The intercorrelations of attitudes seem to indicate that an individual who is liberal on one issue is somewhat more likely to be liberal than to be conservative on another social question.

7. The intercorrelations of attitudes act as if there were three factors operating to produce them.

8. An analysis of these factors from a psychological standpoint indicates that they may be (1) an intelligence factor, (2) a general "radical-conservative" factor, and (3) a religious factor.

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## LES ATTITUDES DES ÉTUDIANTS NON DIPLÔMÉS

(Résumé)

On a déterminé au moyen des Echelles des Attitudes de Thurstone les attitudes de 215 étudiants de dernière année à l'Université de Chicago à l'égard de la prohibition des liqueurs, de Dieu, du pacifisme, du communisme, et de la limitation de la natalité. Les étudiants se montrent opposés à la prohibition, favorablement disposés envers le pacifisme et la limitation de la natalité, et neutres à l'égard du communisme et de la réalité de Dieu. Les étudiantes sont plus favorables à la prohibition, et croient plus fortement à la réalité de Dieu que les étudiants. Les étudiants des sciences sociales favorisent un peu plus le communisme et le pacifisme que les étudiants des sciences physiques. Les étudiants juifs ont les attitudes les plus libérales à l'égard de ces questions sociales; les étudiants catholiques sont les moins libéraux, sauf à l'égard de la prohibition, à l'égard de laquelle les étudiants protestants sont les moins libéraux. L'intelligence ne montre aucune corrélation avec l'attitude à l'égard de la prohibition, mais montre une corrélation positive avec les attitudes favorables à l'égard du communisme, de la limitation de la natalité, du pacifisme, et de l'athéisme. Les intercorrélations des attitudes semble indiquer qu'un individu qui est libéral à l'égard d'une question est plus incliné à être libéral qu'à être conservateur à l'égard d'une autre question sociale. Les intercorrélations des attitudes agissent comme s'il y avait trois facteurs qui opéreraient pour les produire; une analyse de ces facteurs indique qu'ils peuvent être (1) un facteur d'intelligence, (2) un facteur général 'radical-conservateur', et (3) un facteur religieux.

CARLSON

## ATTITÜDEN VON STUDENTEN

(Referat)

Die Attitüden von 215 Studenten auf der Universität Chicago wurden in bezug auf Prohibition, Gott, Pazifismus, Kommunismus, Empfängnisverhütung mittels der Thurstone Attitüdenmethode festgestellt. Es zeigte sich, dass die Studenten gegen Prohibition waren, während sie mit Pazifismus und Empfängnisverhütung sympathisch waren, und neutral in bezug auf Kommunismus und die Wirklichkeit Gottes. Die Studentinnen waren bezüglich Prohibition günstiger und hatten einen stärkeren Glauben an Gott als die Studenten. Soziologiestudenten waren bezüglich Kommunismus und Pazifismus etwas günstiger als die Studenten der Naturwissenschaften. Jüdische Studenten sind am freisten in ihren Attitüden in bezug auf diese soziale Fragen; katholische Studenten sind am wenigsten frei in ihren Attitüden, ausser Prohibition, wogegen die protestantischen Studenten am wenigsten frei sind. Intelligenz steht nicht in Wechselbeziehung mit der Attitüde auf Prohibition, sondern wird positiv einer sympathischen Attitüde auf Kommunismus, Empfängnisverhütung, Pazifismus und Atheismus zugeordnet. Die Zwischenkorrelationen von Attitüden scheinen anzudeuten, dass ein Individuum, das frei in bezug auf eine Frage ist, wahrscheinlicher freier als konservativ in bezug auf eine andere soziale Frage sein wird. Die Zwischenkorrelationen von Attitüden wirken, als ob drei Faktoren tätig wären, um sie zu erzeugen; eine Analyse von diesen Faktoren deutet an, dass sie ein Intelligenzfaktor, ein radikal-konservativer Faktor, ein religiöser Faktor sein könnten.

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# FAMILY RESEMBLANCES IN PERSONALITY TRAITS\*

*From the Psychological Laboratory of the University of Nebraska*

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E. LOUISE HOFFEDITZ

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## INTRODUCTION

Although much research has been conducted in the field of personality and its factors, very little, if any at all, has been carried on with the family as the center of interest. We often hear and read how a son is the very likeness of his father or his mother in one trait or another and how a daughter manifests a certain trait evident in one parent or the other. Again, we are told how children are so different from their parents and each other that we can scarcely believe that they belong to the same family.

Just how much children resemble their parents and one another in personality traits, in so far as such traits can be measured, is in general the subject of this investigation. Other issues, arising as the work progressed, are treated. We make no effort to prove whether any resemblance which may exist is due to heredity or environment; we are merely attempting to find the amount present.

Studies with the family as the nucleus are scarce in the field of personality factors. Clinical material has been amassed on the abnormal types of personality running through families, usually assigning the results to heredity or seeking an hereditary factor which operates to bring out the type. The normal personality has been little touched from this point of view.

Rosanoff (6) holds that in familial groups dissimilar heredity is the rule and similar heredity the exception, just as in individuals mixed types are the rule and pure types the exception.

Much stress is laid on social heredity by Blanchard (2), who believes that "desire of approval and natural tendency to imitate incite the child to pantomime attitudes that he sees in parents until they are woven into the habit system that controls his own behavior and have become an integrated factor of the whole person-

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ality. . . . Many traits are taken over from the parents by the imitative children to the extent that justifies the comment of Watson to the effect that parents create their children after their own image."

The weight that parents' influence has in forming personalities of their children is felt by Goodenough and Leahy (5) when they say that the modification of the conditions which make children's adjustment in the family so difficult could be greatly remedied through suitable parental education.

White (quoted in 9, p. 312) states that the parent of the same sex as the child needs be a good model, since the relation of the parent to the child is such that "quite instinctively the child desires to be like the parent" (p. 312).

In personality development the psychoanalysts point to the Oedipus complex in boys as an indication "that the child's psychic relation to his parents constitutes one of the most important and one of the most difficult features in individual mental growth" (3, p. 13). The Oedipus complex shows a boy's love for his mother and hatred and jealousy of his father. In the case of girls who love their fathers and hate their mothers, it is referred to as the Electra complex.

#### PROCEDURE

The data used in this study are those gathered from the answers of members of 100 families to "The Personality Inventory," set up by Dr. Robert G. Bernreuter and published by the Stanford University Press. The inventory consists of 125 questions which pertain to an individual's behavior and which are answered by encircling the *Yes*, the *No* or the ? placed before the question.

This inventory is unique for the present in that it measures several different aspects of personality at one time. The three traits measured and the symbols by which they are designated are:<sup>1</sup>

B1-N—*A measure of neurotic tendency.* Persons scoring high on this scale tend to be emotionally unstable. Those scoring low tend to be well-balanced emotionally.

B2-S—*A measure of self-sufficiency.* Persons scoring high on this scale prefer to be alone, rarely ask for sympathy or encouragement, and tend to ignore the advice of others. Those scoring low dislike solitude and tend to seek advice and encouragement.

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<sup>1</sup>From the manual for "The Personality Inventory."

B4-D—*A measure of dominance-submission.* Persons scoring high on this scale tend to dominate others in face-to-face situations. Those scoring low tend to be submissive.

A measure of introversion-extroversion, designated B3-I, is omitted from this study inasmuch as it has a correlation of .93 with neurotic tendency. This may mean that practically the same thing is being measured. Since introversion-extroversion has almost as many definitions as it has investigators interested in the trait, we did not consider it a meritorious addition to the study.

The reliability of the scales ranges from .85 to .92 as computed by the author. The coefficients of validity, gained when the scales are compared with other validated tests and corrected for attenuation, range from .84 to 1.00 with all but one coefficient above .92.

The questions of the inventory, when answered, are scored by the use of keys for each trait. Weights varying from +7 to -7 were assigned to each response by Dr. Bernreuter in accordance with its diagnostic value. The total score for a trait is the algebraic sum of the weights which correspond to the responses made by the individuals as given on the key for that particular trait.

A family here consists of father, mother, and at least two children of high-school age or over. The test is not adapted for use by younger children because of the type of questions asked. More than two children were tested in all cases where they were available. They did not necessarily live with their parents, some being married and having children.

In all, 100 fathers, 100 mothers, 111 sons, and 145 daughters were tested. Families with one son and one daughter are most numerous, there being 31. There are 22 families of two daughters each, 10 families of two sons, 10 of two sons and one daughter, and 9 of one son and two daughters. The other 18 are distributed among families of three to six children.

Most of the families live in a Pennsylvania city of 50,000. Some few live in small towns nearby. They are all normal in that the children when young lived with their parents. The greatest possible number of social and economic groups are represented. However, when the fathers are separated into three groups according to occupational intelligence, division based on the Barr Socio-Economic scale, we find a smaller number in the low group than in either of the other two. This is not in accordance with the pro-

portion of such families in the total population. We found, however, that many families who would have fallen into the low group were intellectually unable to answer the questions which we considered valid. In so far as it proved possible, then, these families form a random sample.

Some families answered the inventories in groups, each person marking his own form, with the author or member of her family as director. In some instances there was one member of the investigated family who because of previous experience was capable of handling the testing. No respondent knew what personality traits were being measured.

The range, means, and standard deviation of scores for each trait as calculated for mothers, fathers, sons, and daughters are presented in Table 1.

TABLE 1  
RANGE, MEAN, AND STANDARD DEVIATION OF SCORES

Trait		Fathers	Mothers	Sons	Daughters
Neurotic tendency	Range	352	321	373	361
	Mean	-53.2	-11.1	-55.1	-15.0
	S.D.	2.585	2.368	2.846	2.615
Self-sufficiency	Range	226	221	277	263
	Mean	29.3	-11.2	15.9	-7.3
	S.D.	2.451	2.398	2.817	2.792
Dominance	Range	272	295	252	268
	Mean	45.7	5.1	47.4	17.5
	S.D.	2.717	2.637	3.204	3.071

### TRAIT CORRELATION

Statistical methods are at the present time better suited to intellectual than to conative or affective functions, and it is with the latter that we are chiefly concerned in our study of personality (1). It is necessary, however, to use some method of molding raw scores into an intelligible form. By choosing those statistical formulae which seem to be most acceptable and most workable, we obtain results that are useful in indicating the general trend of the factors under consideration.

In order to compute the relationships among family members (excluding siblings, who will be treated later), we employed the Pearson coefficient of correlation as adapted for use on the calculating machine. Correlation charts were set up, inasmuch as the

data did not lend themselves to immediate use in their raw form. Table 2 shows the coefficients and their P.E.'s for each trait for all family members except siblings.

TABLE 2  
COEFFICIENTS OF CORRELATION AND P.E.'s FOR TRAITS AMONG  
FAMILY MEMBERS

Trait	Members	Mothers	Sons	Daughters
Neurotic tendency	Fathers	.160±.066	.064±.064	.231±.053
	Mothers		.008±.064	.267±.052
Self-sufficiency	Fathers	.091±.067	.200±.062	.087±.054
	Mothers		.053±.064	.166±.054
Dominance	Fathers	.152±.066	.191±.062	.203±.054
	Mothers		.024±.064	.284±.052

We note that:

1. These coefficients are low, ranging from .008 to .284.
2. The two highest correlations, .267 and .284, are those between mothers and daughters for neurotic tendency and dominance, respectively.
3. Sons and mothers show the three lowest correlations, .008, .024, and .053.
4. The coefficients between fathers' and mothers' scores are positive and low.

The small coefficients show that there is little agreement between the traits of one member of the family and those of another. The correlations between mothers' and daughters' scores indicate that their similarities in neurotic tendency and dominance will tend to be more marked than will the similarities in any of the traits between other members of the family. Sons bear no relationship to their mothers in the three traits measured. This may indicate that mothers do not have as great an influence over their sons as they do over their daughters. The saying that "opposites attract" in men and women is not upheld here. To confirm such a belief the correlation between mothers and fathers should be markedly negative.

Another method of comparing the traits of the children with those of the parents is a correlation of the means of the fathers' and mothers' scores with the means of the children's scores. The results are given in Table 3.



TABLE 3  
CORRELATION COEFFICIENTS BETWEEN MEANS OF PARENTS' AND  
CHILDREN'S SCORES

Trait	Coefficients and P.E.
Neurotic tendency	.278±.062
Self-sufficiency	.206±.064
Dominance	.294±.055

All coefficients are too low to be significant of existing relationship.

### SIBLING RELATIONSHIP

The traits of the siblings were studied in five groups of families homogeneous in number of children of each sex. Those groups are mentioned under "Procedure" as having the highest frequencies and involve 82 of the 100 families. The other 18 were inspected and will be discussed later.

Instead of calculating the coefficients of correlation, we considered the standard deviation of the differences between means in each group. Within each family the son's score ( $s$ )<sup>2</sup> or the mean of the sons' scores,  $M(s)$ , if there was more than one son in the family, was considered to be one variable. The daughter's score ( $d$ ) or the mean of the daughters' scores,  $M(d)$ , was the other variable. If the siblings were of the same sex, the score of the older ( $o$ ) was one variable and the score of the younger ( $y$ ) was the other. For each variable the mean value and standard deviation were computed.

The actual difference ( $D$ ) between the mean of one variable and that of another was compared with the standard deviation of the difference between the means. This ratio can be translated into the chances that the true difference between the means is greater than zero (8, p. 137). Table 4 shows the results obtained for each personality trait. The last column, *Chances to 1*, shows the chances that  $Var-1$  will exceed  $Var-2$ .

Although the findings cannot carry great weight because of the small numbers involved in each group, we may note these features:

1. In one case only is the relationship somewhat significant,

<sup>2</sup>The letters in parentheses are those used to designate the variables in Table 4.



TABLE 4  
RELATIONSHIP BETWEEN SIBLINGS AS COMPARED WITHIN GROUPS OF FAMILIES OF THE SAME SIZE AND COMPOSITION  
ACCORDING TO SEX

Trait	No. of families	No. of children	Comparison groups		Mean scores		D	$\sigma(D)$	Chances to 1
			Var-1	Var-2	Var-1	Var-2			
Neurotic tendency	31	1s 1d	s	d	-57.3	-19.9	-47.4	19.87	111.0
	22	2d	o	y	-41.0	-28.9	-12.1	20.47	2.6
	10	2s	o	y	-65.1	-4.1	-37.0	37.05	18.8
	9	2s 1d	M(s)	d	-39.6	25.4	-65.0	34.83	33.1
	9	1s 2d	s	M(d)	-42.2	-26.4	-15.8	34.70	2.1
Self-sufficiency	31	1s 1d	s	d	14.7	-9.4	25.1	13.82	27.4
	22	2d	o	y	44.2	6.0	38.2	15.89	121.0
	10	2s	o	y	24.5	-9.3	33.8	21.37	16.2
	9	2s 1d	M(s)	d	20.3	-35.5	55.8	18.39	836.0
	9	1s 2d	s	M(d)	-8.8	-7.7	-1.1	82.60	1.0
Dominance	31	1s 1d	s	d	49.5	27.1	22.4	92.44	1.5
	22	2d	o	y	37.7	29.0	8.7	16.41	2.3
	10	2s	o	y	56.4	21.5	34.9	28.95	7.7
	9	2s 1d	M(s)	d	30.7	3.3	27.4	24.74	6.4
	9	1s 2d	s	M(d)	41.0	19.0	22.0	70.32	1.6

indicating that in families of two sons and one daughter the mean of the sons' scores would usually surpass the daughter's score in self-sufficiency.

2. Though small, the other differences show sons to be in general less neurotic, more self-sufficient, and more dominant than daughters in the same family.

3. Older children tend to be less neurotic, more self-sufficient, and more dominant than younger children in the same family.

When considering the siblings of the 18 families who do not fit into the large groups, we find that as the age of the children increases all three traits show cases of decrease and increase in scores. There is no noticeable pattern or trend evident from family to family.

#### PARENT CHANGE AFTER MARRIAGE

Allusion has often been made in popular parlance to the extent to which parents become alike as they grow older together. Data here are not available on how long the mothers and fathers have been married. Following the assumption, which is in general true, that the oldest lived together the longest time, we divided the parents on the basis of age.

There are 19 families in which parents are 45 or under and 24 in which both are 56 or over. Table 5 shows the correlation coefficients and their probable errors for both groups of parents for each trait, using the method of rank-differences. The obtained values of rho were changed into Pearson  $r$ 's by a table to infer such a change (4, p. 192).

TABLE 5

COEFFICIENTS OF CORRELATION FOR PARENTS ACCORDING TO AGE GROUPS

Trait	45 or under	56 or over	Difference
Neurotic tendency	.552±.107	— .074±.137	.625
Self-sufficiency	.118±.152	— .092±.136	.210
Dominance	.360±.134	— .173±.133	.533

The coefficients themselves are not as significant as is the change with the age groups. Each trait shows a decided decrease from the younger to the older group, which may mean that the fathers

and mothers are growing unlike rather than alike. The high probable errors tend to reduce the reliability of the difference, especially in self-sufficiency.

#### PARENT-CHILD RELATIONSHIPS IN AGE GROUPS

For consideration of the relationship between traits of children and parents who were young when the children were born and between those of children and parents who were older when their children were born, we divided the families according to the difference in age between the younger parent and the oldest child. There are 21 families in which the difference is 21 years or less and the same number in which the difference is 28 years or more.

The mean of the children's scores was compared with the mean of the parents' scores. Computing the standard deviation of the difference between means, we found the significance of the difference. The chances that the differences found here are real are very low, ranging from 1.4:1 to 3.6:1. We may conclude that there is little consistency and change in the relationship between traits of parents and children when a group of families in which the children were born early in their parents' lives is compared with a group in which the children were born later in their parents' lives.

#### CHILDREN OF DEVIATE PARENTS

The idea is sometimes held that the parents possessing a personality trait to a marked degree have children with traits likewise marked. For a study of this, we considered a parent to be a decided deviate with reference to his group when he or she possessed a trait so pronounced that he stood in the first or last decile of that trait as found in the 100 parents of the same sex. The bottom decile contained the individuals with the most negative traits, the top contained those with the most positive. The same traits in the children of those parents were studied by finding the percentage of these sons and daughters falling above and below the means of their respective sexes. The number of such children ranged from 7 to 17. Mothers and fathers deviating in each direction were compared separately with sons and daughters in the three traits, thus yielding 24 situations for consideration.

Results show that:

1. In 9 situations the children are almost equally divided on either side of the mean of the trait under consideration.
2. In 11, more than 60% of the children fall on the side of the mean in the direction in which their mothers or fathers are deviates.
3. In 4, more than 60% of the children fall on the side of the mean opposite to that in which their mothers or fathers are deviates.
4. One noticeable case exists when the 13 daughters who have mothers in the top decile in dominance lie above the mean of all the daughters in dominance.

A more limited aspect was taken when we considered the percentage of these same children which fell into the extreme deciles with respect to their own group. Results in the 24 situations thus gained show that:

1. In 4, 20% or more (none higher than 31%) of the children are in the same decile as their deviate parents.
2. In one instance 23% of the children are in the decile opposite to that of their parents.
3. In the other 19 cases the percentages in either decile are not so marked, 6 showing equal amounts in each, ranging from 0% to 17%.
4. Two marked instances are those where in the top decile 31% of the daughters have mothers who are deviates in dominance and again in the same decile 30% of the daughters have fathers who are deviates in dominance. In both cases no one is found in the bottom decile. On the other hand, extremely dominant fathers have sons of which 21% are in the bottom decile.

Highly positive fathers or mothers do not have extremely positive or negative children, neither do very negative parents have extremes in children. They tend to center around a mean, or zero point, between the positive and negative. In general, individuality seems to override home and family influences.

#### EFFECT OF EMPLOYMENT GROUPING

Using the Barr scale of occupational intelligence (7, pp. 66-69) as a guide, we divided the occupations of the fathers into three groups: low, medium, and high. The divisions are purely arbi-

trary and could be shifted in either direction. There seemed, however, to be fairly well-marked gaps between the groups as selected. The low group contained 27 men, the middle 40, and the high 33. The size of these groups was commented upon in the section under "Procedure."

The mean of the fathers' scores in each of the employment groups is given in Table 6.

TABLE 6  
MEAN SCORES OF FATHERS' TRAITS BY OCCUPATIONAL GROUPS

Groups	No. in group	Neurotic tendency	Self-sufficiency	Dominance
Low	27	—33.8	3.2	39.8
Medium	40	—55.6	24.3	39.2
High	33	—72.3	31.6	62.8

These features can be noted in the trait means of the fathers, who are divided by use of the Barr scale into three groups of occupational intelligence: low, medium, and high:

1. The amount of neurotic tendency decreases as one proceeds from the high, through the medium, to the low group.
2. Self-sufficiency is the greatest in the high group, somewhat less in the medium, and least in the low.
3. There is decidedly greater dominance in the high group than in the medium, but equal in the medium and low.

The means scores would indicate that the high group in occupational intelligence has in all traits the characteristics we would expect a well-adjusted individual to have. The position of these men in the occupational world may be either the cause or result of their traits. This finding seems to indicate that personality traits are more closely linked with occupational levels than they are generally supposed to be.

When the fathers' scores within employment groups are correlated with scores of other members of their families, there seems to be little consistency present and little indication of any trend from low to high groups. There is one exception, the case where coefficients indicate that mothers and fathers are more alike in neurotic tendency as one proceeds up the socio-economic scale. From low to high these  $r$ 's are .075, .255, .387.



## SUMMARY

General conclusions based on the findings when the Bernreuter Personality Inventory is used to obtain trait scores may be summarized thus:

1. The coefficients of correlation show little agreement in the traits of one member of the family with those of another. In two traits mothers and daughters show the highest correlation and in all three traits mothers and sons show the lowest.

2. In groups selected for homogeneity in numbers and sex of siblings, sons in general show less neurotic tendency and more self-sufficiency than daughters. Older children are less neurotic and more self-sufficient than younger. The difference is not always great.

3. The saying that "opposites attract" in men and women is not upheld here.

4. Older parents are less alike than younger, which would seem to disagree with the prevalent idea that people grow alike as they grow older together.

5. The relationship between traits of children and parents is not greatly nor consistently different when a group of families in which the children were born early in the parents' lives is compared with the group in which the children were born later.

6. Fathers or mothers who were deviates to the extent that their scores stood in the top or bottom decile of any one trait have children who tend to group around their mean for the trait rather than to fall into the top or bottom decile.

7. Neurotic tendency decreases as occupational intelligence increases, according to the mean scores gained when dividing the fathers into three groups. Self-sufficiency increases as the intelligence increases. Dominance is greatest for the high occupational group and lower, but equal, for the medium and low groups.

It is reasonable to expect that if another sample of the population were taken, the correlation between traits of family members (not including sib against sib, since they were not correlated) would approximate those found here. The smaller numbers involved in the other findings hinder such a generalization, but point out questions which might well be investigated under more favorable conditions.

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## LES RESEMBLANCES FAMILIALES DANS LES TRAITS DE PERSONNALITÉ

(Résumé)

On a fait subir "L'Inventaire de Personnalité" de Bernreuter à 100 familles et l'on a noté les résultats à l'égard de la tendance à la névrosité, de la suffisance et de la dominance. Chaque famille a eu du moins deux enfants de l'âge des collégiens ou plus âgés. On a testé un total de 456 personnes.

Les coefficients de corrélation de Pearson entre les membres de la famille (sauf frère ou soeur comparé à frère ou soeur) pour ces traits sont peu élevés, variant de 0,008 à 0,284. Les enfants de même famille ont été étudiés en groupes formés selon le nombre et le sexe des enfants dans une famille. Les fils montrent en général moins de tendance à la névrosité et sont plus suffisants que les filles tandis que les enfants plus âgés ont moins de tendance à la névrosité et sont plus suffisants que les jeunes.

Les résultats indiquent que les "contraires" ne s'attiraient l'une l'autre au cas des hommes et des femmes et que les parents plus âgés se ressemblent moins que les jeunes. La relation entre les traits des parents et ceux des enfants n'est ni beaucoup ni constamment différente quand on compare un groupe de familles où les enfants sont nés tôt dans la vie des parents et un groupe où les enfants sont nés plus tard.

Les pères ou les mères qui montrent beaucoup de déviation à l'égard d'un trait quelconque n'ont pas en général des enfants qui montrent cette dévia-

tion. On a comparé les résultats moyens des groupes de pères élevés et peu élevés quant à l'intelligence du métier, jugée selon l'échelle de Barr. Le groupe élevé est moins enclin à la névrosité, plus dominant et plus suffisant que le groupe peu élevé.

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## FAMILIENÄHNLICHKEITEN IN CHARAKTERZÜGEN

(Referat)

Das Bernreuter "Personality Inventory" wurde 100 Familien gegeben und nach neurotischer Neigung, Selbstständigkeit, und Herrschaftsuche verwertet. Jede Familie besass mindestens zwei Kinder im vorschulpflichtigen Alter oder älter. Die Gesamtzahl von 456 Personen wurde untersucht.

Pearsons Korrelationskoeffizienten zwischen den Familienmitgliedern (Geschwister ausgenommen) in bezug auf diese Charakterzüge waren niedrig, etwa von ,008 bis ,284. Die Geschwister wurden in Gruppen nach Anzahl und Geschlecht der Kinder in der Familie eingeteilt und untersucht. Söhne zeigten im allgemeinen eine kleinere neurotische Neigung und eine grössere Selbstständigkeit als die Töchter, während die älteren Kinder weniger neurotisch und selbstständiger sind als die jüngeren.

Es ergab sich, dass sich "Gegensätze" bei Männern und Frauen nicht anziehen, und dass ältere Eltern sich weniger ähnlichen als jüngere. Das Verhältnis zwischen den Charakterzügen der Eltern und denen der Kinder ist nicht sehr verschieden, wenn eine Gruppe von Familien, in der die Kinder früh im Leben der Eltern geboren wurden, mit einer Gruppe, in der die Kinder spät geboren wurden, verglichen wird.

Die Väter und Mütter, die sehr abweichend sind, haben im allgemeinen abweichende Kinder. Durchschnittswerte für die Gruppen von Vätern, die hoch und niedrig in Berufsinelligenz nach der Barr Skala waren, wurden verglichen. Die hohe Gruppe ist weniger neurotisch, herrschaftstüchtiger und selbstständiger als die niedrige.

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# SHORT ARTICLES AND NOTES

## A SIMPLE AND RELIABLE METHOD OF SCORING THE THURSTONE ATTITUDE SCALES

RENSIS LIKERT, SYDNEY ROSLOW, AND GARDNER MURPHY

In a previous investigation (1) it was found that one of the Thurstone attitude scales (2), when scored by a simpler method than the original Thurstone method (i.e., without the use of a judging group), yielded a higher reliability coefficient than the latter method and still correlated highly with it. In order to determine whether the simpler method of scoring would consistently prove to be satisfactory the present study was undertaken.

In the original study the scale used was the Droba Attitude toward War Scale, Scale No. 2.<sup>1</sup> In the present study the following Thurstone Scales<sup>1</sup> were used:

Scale	No.	Prepared by
Attitude toward Birth Control,	Scale No. 21	C. K. A. Wang and L. L. Thurstone.
Attitude toward the Chinese,	Scale No. 23	Ruth C. Peterson.
Attitude toward Communism,	Scale No. 6	L. L. Thurstone.
Attitude toward Evolution,	Scale No. 30	Thelma G. Thurstone.
Attitude toward the Germans,	Scale No. 25	Ruth C. Peterson.
Attitude toward God, 1. Reality of God. 2. Influence on Conduct.	Scale No. 22	E. J. Chave and L. L. Thurstone.
Attitude toward the Negro,	Scale No. 3	E. D. Hinckley.
Attitude toward War, Droba,	Scale No. 2	D. D. Droba.
Attitude toward War, Peterson,	Scale No. 34	Ruth C. Peterson.

Forms A and B of all scales were used. In the case of the Attitude toward God Scale, Forms A and B of this scale deal with the Reality of God and Forms C and D have to do with Influence on Conduct; all four were used.

All the subjects were men. Groups A, B, C, D, E, and F are students in the University College of Arts and Pure Science of New York University. Groups G and H are students in College of Engineering of the same institution. Groups I, J, K, and L consist of students at the College of the City of New York, and Group M is made up of high-school seniors.

<sup>1</sup>Published by the University of Chicago Press.

The directions at the top of the attitude scales were changed to read as follows:

If you agree with a statement put a plus (+).

If you strongly agree with a statement, put a plus with a circle around it ( $\oplus$ ).

If you disagree with a statement put a minus (—).

If you strongly disagree with a statement, put a minus with a circle around it ( $\ominus$ ).

If you are undecided, put a question mark (?).

After the subjects had indicated their reaction to the statements, the scales were scored by the Thurstone method.<sup>2</sup> They were then scored by the simpler method in the following manner: One extreme of the attitude continuum (2), such as "most favorable to the Negro," was designated as the numerically high position and the extreme alternative (strongly agree or strongly disagree) of each statement which corresponded in attitude with that extreme of the attitude continuum was given a value of 5. The other extreme alternative of the given statement was assigned a value of 1. The intermediate alternatives were assigned intermediate values, the interrogation

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<sup>2</sup>A simple mechanism was developed to aid in scoring the scales by the Thurstone method. It greatly facilitates finding the median of the scale values of the statements with which the individual agrees. It was found to reduce the scoring-time by about one-half. The apparatus consists of a base upon which are mounted a number of hinges or flaps which swing from a common horizontal axis, the number being equal to the number of items in the scale. It is advisable to prepare 24 hinges, although the scales usually have from 18 to 22 items. It is desirable to make these flaps as small as possible yet of sufficient size to be conveniently used. Over each flap is placed a close-fitting paper envelope arrangement; or a small paper label can be pasted on each side. On both faces of each flap are printed the scale value of one statement and the number of that statement, preferably in red on one side and blue on the other. The scale values are arranged in numerical order so that they read from lowest to highest.

To score, one sets the scoring key against the test paper and turns over the flaps which bear the values of the items with which the individual agrees. Since the scale values are arranged in numerical order, the scorer can then in a glance pick the middle flap or flaps of those which have been turned over. This flap bears the median value, which is tabulated as the individual's score. A single upward movement of a rod extending under the open flaps swings them back into the original position. If the order of the numbers of the flaps, as they correspond to the numbers of the statements, is memorized, the use of the scoring key is not necessary. Then one need only look for the numbers of the statements which are checked, and turn over the hinges bearing the corresponding numbers. Such a scoring device as this will save considerable time where a great deal of scoring by the Thurstone method of these Attitude Scales is to be done.



point always having, of course, a value of 3. Thus, for example, statement number five, Form A, of the Attitude toward the Negro Scale is, "I place the Negro on the same social basis as I would a mule." Obviously to "strongly agree" with this statement reflects an attitude which is "more unfavorable to the Negro" than "to strongly disagree"; consequently, the "strongly agree" alternative is given a score of 1 and "strongly disagree" is scored 5. This assumes, of course, that we have previously designated the "most favorable to the Negro" extreme of the attitude continuum as the numerically high position. In a similar manner numerical values from 1 to 5 are assigned to each alternative for each statement in the attitude scale.

On each form, however, certain statements could not be used in this scoring method because it was found impossible to determine whether to assign a value of 1 or 5 to the "strongly agree" alternative. An illustration of such a statement is number 5 in Form A of the Droba War Scale: "Compulsory military training in all countries should be reduced but not eliminated." If a subject "agrees" while following the present directions it is impossible to say whether he is agreeing with the "reduction" aspect of this statement or the "not eliminated" aspect. A person who strongly opposes compulsory military training would disagree or strongly disagree with the "not eliminated" aspect whereas a person who favors compulsory military training would probably disagree or strongly disagree with the "reduction" aspect of the statement. Obviously for the present 1-to-5 method of scoring the statement is double-barreled and of little value because it does not differentiate persons in terms of their attitudes. Persons at opposite ends of the attitude continuum may at times check the same alternative.

TABLE 1  
STATEMENTS OMITTED FROM THE THURSTONE SCALES WHEN SCORING THEM  
BY THE SIMPLER METHOD

Scale No.	Attitude Scale	The statement number of those statements which were not used in the simpler scoring method	
		Form A	Form B
21	Birth control	6	20
23	Chinese	5, 13	5, 17
6	Communism	1, 4, 14	6, 16, 18
30	Evolution	2, 7, 14, 16	1, 6, 10, 17
25	German	7, 14, 16, 18	8, 11, 12, 14
22	God—Reality of	4, 6, 9, 12, 13, 17	2, 4, 6, 11, 12, 16
22	God—Influence on Conduct (Forms C-D)	2, 11, 13, 17, 19, 21, 22	2, 11, 13, 17, 19, 21, 22
3	Negro	7, 12, 15	3, 4, 15
34	War—Peterson	16	18
2	War—Droba	5, 8, 10, 17	5, 10, 17, 20

In general, those statements whose scale values in the Thurstone method of scoring fell in the middle of the scale (5.0-6.0) were the statements that were found to be unsatisfactory for the simpler method of scoring. Table 1 shows the number of those statements which were not used for each attitude scale.

After assigning a numerical value to each alternative of each statement that was used, the score of every individual was obtained by adding the numbers corresponding to the alternatives that he had checked. In the case of each attitude scale, the same number of statements was used for each form.

The criterion of internal consistency was used to determine whether the numerical values had been assigned to the different alternatives in a consistent manner. Approximately, the highest and lowest 25 per cent of each group were used and their response to each statement tabulated. Then, if the numerical values have been properly assigned to the alternatives for each statement, the sum of the responses for the high group should be higher than the sum for the low group *for each statement*. The same number of individuals was used, of course, in both high and low groups. In case the sum for the two groups is practically the same for a given statement, it indicates that the statement fails to differentiate the group in the manner done by the other statements and hence is of no value for this particular scale. It is also possible, although it has not occurred in our experience, that the sum for the high group might be appreciably smaller than the sum for the low group for a given statement. If this should occur, it would indicate that we have assigned numerical values to the alternatives in the reverse order of what they should be; i.e., what we have designated 5 should be 1, etc.

The reliability coefficients were calculated for the different attitude scales for both methods of scoring and the coefficients of correlation between the two methods of scoring were computed. The results are shown in Table 2. The obtained reliability coefficient shows the value of the correlation coefficient between Forms A and B of each scale. The predicted reliability coefficient shows the expected reliability based on the Spearman-Brown formula for the combined scores of the two forms.

An examination of Table 2 shows that the results of this study are similar to the results obtained in the early investigation (1). When the reliability coefficients for the two methods of scoring are equated for the number of items used, the simpler method is found to yield higher reliability coefficients than the Thurstone method for all ten attitude scales and for every group used. In many instances the reliability obtained by the simpler method of scoring is considerably higher than that obtained by the Thurstone method.

TABLE 2  
A COMPARISON OF THE RESULTS OBTAINED FROM THE TWO METHODS OF SCORING

Scale No.	Attitude Scale	Group	N	Thurstone method Obtained	Reliability coefficients Thurstone method Predicted	Simpler method Obtained	Predicted	Correlation between the two methods	Number of items used on each form Thurstone method	Simpler method
21	Birth Control	A&B	69	.62	.77	.82	.90	.79	20	19
21	Birth Control	C&E	65	.82	.90	.84	.91	.77	20	19
21	Birth Control	D	45	.82	.90	.88	.94	.83	20	19
21	Birth Control	G&H	56	.87	.93	.91	.95	.88	20	19
23	Chinese	A&H	61	.74	.85	.83	.91	.91	18	16
23	Chinese	K	51	.76	.86	.87	.93	.85	18	16
23	Chinese	L	61	.57	.73	.82	.90	.83	18	16
6	Communism	B	37	.66	.80	.86	.92	.94	20	17
6	Communism	M	68	.72	.84	.76	.86	.88	20	17
6	Communism	J	43	.87	.93	.95	.97	.94	20	17
6	Communism	L	61	.87	.93	.95	.97	.93	20	17
30	Evolution	D&E	65	.75	.86	.80	.89	.95	20	16
30	Evolution	F	50	.67	.80	.80	.89	.88	20	16
25	German	H	26	.42	.59	.67	.80	.85	21	17
22	God—Reality of	A&B	68	.85	.92	.92	.96	.92	20	14
22	God—Reality of	C&E	65	.79	.88	.85	.92	.91	20	14
22	God—Reality of	D	44	.87	.93	.88	.94	.94	20	14
22	God—Influence on Conduct	A&B	66	.86	.92	.91	.95	— .93	22	15

TABLE 2 (continued)

Scale No.	Attitude Scale	Group	N	Reliability coefficients			Correlation between the two methods	Number of items used on each form		
				Thurstone method		Simpler method		Thurstone method	Simpler method	
				Obtained	Predicted	Obtained				Predicted
22	God—Influence on Conduct	C&E	69	.85	.92	.85	.92	— .90	22	15
22	God—Influence on Conduct	D	46	.84	.91	.87	.93	— .88	22	15
3	Negro	I	54	.57	.73	.78	.88	.91	16	12
2	War—Droba	I	54	.71	.83	.84	.91	.87	22	18
34	War—Peterson	D&E	48	.76	.86	.83	.91	— .87	20	15
34	War—Peterson	G	37	.70	.82	.86	.92	— .75	20	15
34	War—Peterson	D&E	48	.76	.86	.90	.95	— .83	20	19
34	War—Peterson	G	37	.70	.82	.89	.94	— .81	20	19
34	War—Peterson	K&L	108	.71	.83	.82	.90	— .82	20	19

Likewise, the correlation between the two methods of scoring is found to be consistently high, which indicates that the simpler method of scoring is measuring essentially what is measured by the Thurstone scoring method.<sup>3</sup> The negative coefficients of correlation between the two methods of scoring in the case of the Attitude toward War Scale of Peterson and the Influence on Conduct part of the Attitude toward God Scale are due to a reversal in the scores assigned by the Thurstone method to the various parts of the attitude continuum. On all the other scales the numerically larger score in the Thurstone method is assigned to the more "favorable" extreme of the attitude continuum. For convenience it is assumed that most social attitudes are "favorable" or "unfavorable" toward some defined idea, act, or group of persons, and high scores are arbitrarily assigned to the "favorable" end. This procedure has been consistently adhered to in the scoring by the simpler method.

The method by which Thurstone scores most of his attitude scales is to use the median of the scale values of the statements with which an individual agrees. Recently some of the scales are being scored by using the median of the scale values of the statements with which a person *strongly* agrees. All the results shown in Table 2 are obtained by scoring the scales by the *former* method. Of the scales used in this study those that Thurstone scores by the latter or "strongly agree" method include the Attitude toward Birth Control Scale and both parts of the Attitude toward God Scale. Consequently, it seemed desirable to compare the Thurstone "strongly agree" method of scoring these scales with the simpler method. This comparison along with the results obtained when these scales are scored by the more common Thurstone "agree" method are shown in Table 3. The data for the Thurstone "agree" method and the simpler method are the same as shown in Table 2, but are reproduced to facilitate comparison.

An examination of Table 3 reveals that, although the directions accompanying these scales call for the use of the Thurstone "strongly agree" method in their scoring, this method is the least satisfactory of all. It proves to be unsatisfactory for two reasons. First, a large number of individuals fail to indicate that they *strongly* agree with any statement. The discrepancy in the number of cases between the "strongly agree" and the "agree" method shows the number of individuals in each group who failed to indicate that they *strongly* agreed with any statement on one or both forms of a scale. Obviously, then, this method cannot be used for obtaining scores on all the individuals in most groups. To use the "agree" method along with the "strongly agree" method in order to obtain scores

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<sup>3</sup>The distribution of scores obtained for each of the different scales when scored by the simpler method will be supplied gladly upon request.



TABLE 3  
A COMPARISON OF THE RELIABILITY COEFFICIENTS OBTAINED FROM THE THURSTONE "AGREE," THURSTONE "STRONGLY AGREE," AND THE SIMPLER METHOD OF SCORING

Scale No.	Attitude Scale	Group	Thurstone "agree" method		Thurstone "strongly agree" method		Simpler method		
			N	Obtained Predicted	N	Obtained Predicted	N	Obtained Predicted	
21	Birth Control	A&B	69	.62	.77	.50	.67	.82	.90
21	Birth Control	C&E	65	.82	.90	.53	.69	.84	.91
21	Birth Control	D	45	.82	.90	— .05		.88	.94
21	Birth Control	G&H	56	.87	.93	.50	.67	.91	.95
22	God—Reality of	A&B	66*	.86	.92	.29	.45	.92	.96
22	God—Reality of	C&E	65	.79	.88	.58	.73	.85	.92
22	God—Reality of	D	44*	.87	.93	.20	.33	.88	.94
22	God—Influence on Conduct	A&B	66*	.86	.92	.78	.88	.91	.95
22	God—Influence on Conduct	C&E	69	.85	.92	.53	.69	.85	.92
22	God—Influence on Conduct	D	45	.84	.91	.54	.70	.87	.93

\*The discrepancy in N is due to the fact that one or two persons failed to agree with a single statement on one or both forms.

TABLE 4  
RESULTS OBTAINED WITH THE SIGMA METHOD OF SCORING

Scale No.	Attitude scale	Group	N	Reliability coefficients sigma method Obtained	Predicted	Correlations between sigma method and Simpler method	Thurstone "agree" method
30	Evolution	D&E	65	.80	.89	.97	.84
30	Evolution	F	50	.81	.90	.97	.84

TABLE 5  
RESULTS OBTAINED WITH THE "THURSTONE WEIGHTED" METHOD OF SCORING

Scale No.	Attitude scale	Group	N	Reliability coefficients "weighted" method Obtained	Predicted	Correlations between "weighted" method and Simpler method	Thurstone "agree" method
23	Chinese	A&H	61	.76	.86	.95	.86
30	Evolution	D&E	65	.78	.88	.97	.87
30	Evolution	F	50	.81	.90	.98	.84
34	War	D&E	48	.87	.93	— .97	.83

for all the individuals has evident objections. In the second place, the "strongly agree" method is unsatisfactory because of the low reliability that it yields. Only one of the correlations between the two forms of a scale (the obtained  $r$ , Table 3) is higher than .70, many of the rest clustering about .53 and some even below .30.

The sigma method which has been fully described elsewhere (1, pp. 21-25) was tried and yielded the expected results which are shown in Table 4. Although much more elaborate than the simpler method the results obtained from the two methods are essentially the same.

Another method which is in a way a combination of the Thurstone and simpler methods was also tried. The results from this method, called the "Thurstone weighted method," are shown in Table 5. The same statements were used in this scoring as were used in the simpler method, but instead of assigning 1-2-3-4-5 to the respective alternatives, the values assigned were based upon the scale values of the Thurstone method. The "strongly agree" alternative of each statement was given the value shown by the Thurstone key for that statement. The "strongly disagree" alternative of each statement was given a value equal to 11.0 minus the value of the "strongly agree" alternative for that particular statement. The question mark was always given the value of 5.5 and the "agree" alternative for each statement was given a value midway between 5.5 and the value of the "strongly agree" alternative for the same statement. The "disagree" position was similarly scored. Thus, for example, statement number one of Form A of the Attitude toward the Chinese has a Thurstone scale value of 7.8; consequently, the "strongly agree" position for this statement receives a score of 7.8. The score of the "strongly disagree" alternative is 11.0 minus 7.8 or 3.2. The "agree" position has a scale value midway between 7.8 and 5.5 (the value of the question-mark position) or 6.65; similarly the "disagree" position has a value of 4.35.

An examination of the data in Table 5 reveals that the "Thurstone weighted method" yields essentially the same results as the simpler method and correlates very highly with it. It is evident therefore that the additional effort required to weight the alternative values is unwarranted, since the simpler method yields results as satisfactory as that obtained from either the sigma method or the "weighted" method.

#### SUMMARY

A simple method of scoring the Thurstone Attitude Scales is discussed, which does not involve the use of a judging group and yet is found to be consistently more reliable than the original method of scoring. The scores obtained by the two methods correlate highly, indicating that they are measuring essentially the same thing.

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## A STUDY OF INTROVERSION AND EXTROVERSION IN A GROUP OF SUBNORMAL CHILDREN

HYMAN GOLDSTEIN

Marston (2), in order to determine by rating methods and experimental test situations "to what extent young children's reactions to their environment, particularly social, are conditioned by constant tendencies to introversion and extroversion," studied 100 children between 2 and 6 years of age at the Preschool Laboratory of the Iowa Child Welfare Research Station of the State University of Iowa. His rating scale included traits whose selection and definition were facilitated by Freyd's (1) original list of 54 traits characteristic of the introvert. The experimental test situations, where the individual's reactions to natural yet controlled situations were observed, gave a correlation of .52 with the ratings of the boys and a correlation of .54 in the case of the girls. This established a moderate validity for the tests and rating scale as devices to measure introvert and extrovert trends. Almost all of the raters were graduate students specially trained in child psychology and knew their subjects well. The reliability of the scale, determined by dividing the 20 traits into two series of 10 each and correlating these halves, gave a coefficient of .89. Correlations between raters who rated a large number of children in common averaged .71. These last two correlations were based on an average rating of 26 subjects. The results, Marston concluded, do not establish definite relationships between chronological age, mental age, height, and weight, on the one hand, and extroversion, on the other hand, in the narrow age range of these children, but extroversion as measured by the experiments decreases with increase in chronological age, a change more apparent in the case of the girls. Marston believes that children long before the normal age of school entrance, even by the age of two and three years, have already developed characteristic attitudes of introversion and extroversion toward certain significant situations.

Powers (3) wished to determine whether the Marston Personality Rating Scale had practical value as a measuring instrument for introversion-ex-

troversion traits in mentally deficient girls at the Francis E. Willard School in Boston. Powers also wished to ascertain whether these adolescent mental defectives were not more extreme in their tendencies toward introversion and extroversion than the younger, more socially promising group measured in Marston's study. The 89 subjects ranged in chronological age from 11 to 16 years, with the median at 14 years and 4 months. Their mental ages ranged from 62 months to 144 months with the median at 108 months, while their Stanford-Binet intelligence quotients ranged from 48 to 82 with a median at 64. The raters, who were especially qualified for their task, had known the subjects from 2 to 124 months. A distribution of the total rating scores of the 89 girls follows closely the normal curve of distribution. Powers concludes that environment, subject-matter, and teacher personality have important bearings in their conditioning of introversion and extroversion; that since these girls inclined only one-tenth of a point more toward extrovert tendencies than the younger, more socially promising group of the Marston study, it is likely that IQ and social status may have no bearing upon introvert-extrovert tendencies.

#### PROBLEM OF THIS STUDY

Underlying this study was a twofold problem: First, was the Marston Personality Rating Scale a reliable technique in measuring tendencies toward introversion or extroversion in a group of institutional, subnormal children? Secondly, would any significant correlations be revealed between the scores on the rating scale and other quantitative data that could be secured concerning these children?

#### SUBJECTS OF THE STUDY

The subjects of the study were 76 children between 129 and 209 months of age. This group was comprised of 51 boys of the Edenwald School for Boys and 25 girls of the Edenwald School for Girls of the Hebrew Orphan Asylum of the City of New York, located at 225th Street and Boston Post Road, New York City. The schools are, according to the director, designed for the manually minded child and to serve the needs of those children "whose psychological make-up emphasizes a tendency toward manual occupation, and whose education should therefore stress vocational instead of general academic training."

The boys range in age from 129 to 198 months while the girls range from 157 to 209 months, with average ages of 164.9 and 185.8 months, respectively. The average chronological age of the boys exceeds the average mental age of the boys 43 months, and the average chronological age of the girls exceeds their average mental age 46 months. The intelligence-quotient range is, in the case of the boys, from 57 to 88, and in the case of the girls, from 65 to 87, with averages of 72.4 and 75.4, respectively. In



months of commitment, the boys range from 5 to 147 months, the girls from 23 to 65 months, with respective averages of 49.5 and 72.5 months. In height, the boys (data from 23 boys) range from 52.5 to 68 inches, while the girls range from 54.5 to 66.5 inches with respective averages of 58.4 and 61.2 inches. In weight the boys range from 60 to 133 pounds, and the girls from 90 to 151 pounds, with averages respectively of 85.4 and 119 pounds. In mechanical ability (Stenquist Form 1), the boys (data from 45 boys) range from 17 to 58 points, with an average of 37.3 points.

#### THE RATERS

The raters were, in general, persons well acquainted with the psychological interpretation of the emotional tendencies revealed, all the raters knowing the subjects rather intimately. Their occupations and ages are: Boys' Raters: B, Director, 28; EK, Head Supervisor, 24; F, Assistant Supervisor, 25; C, Supervisor, 24; M, Manual Arts Teacher, 33. The girls' raters are: AK, Head Worker, 49; T, Academic Teacher, 41; SK, Vocational Teacher, 28.

#### RESULTS OF RATINGS

In the case of the boys, the average ratings range from 39 to 81 and average 61.4, while the girls' average ratings range from 33 to 90 and average 59.9. The average for boys and girls together is 60.9, which approximates very closely the balancing of the two opposing tendencies, 60.

The distribution of the average total introversion-extroversion ratings of the 76 subjects is approximately that of a normal distribution.

The diagnosticity of the various traits of the scale is revealed when the trait ratings of the 7 most extroverted and the 7 most introverted children are compared. The differences between the averages of the two groups on each trait vary from 0.6 to 3.3 points (4 points being the maximum possible range). The average of these differences is 2.1 or approximately one-half of the scale's range. A comparison between the total average ratings of the 7 most introverted and the 7 most extroverted of the Marston study and of this study is shown in Table 1.

It can be gathered from these data that the children of this study were 3

TABLE 1

	Marston	Goldstein	Difference
Range of ratings, introvert	31-41	33-44	
Range of ratings, extrovert	83-91	77-90	
Total average, introvert	37	40	3
Total average, extrovert	87	82	5
Total difference between averages, introvert and extrovert	50	42	8

points more extroverted and 5 points more introverted than the children of Marston's study; in other words, this group of institutional, subnormal children inclined 2 points more toward tendencies of introversion than the younger, more socially promising, and more intelligent group of the Marston study.

The differences between the averages of the 7 most introverted and the 7 most extroverted children in this study and in the Marston study were compared, trait by trait. In general, the traits which are the most diagnostic and the least diagnostic in the Marston study are also the most and least diagnostic in this study.

#### RELIABILITY OF THE SCALE

As in the Marston study, the reliability of the scale was determined by dividing 20 traits into two series of 10 each and correlating the partial ratings on these two series. Each trait of one series was matched as closely as possible with a trait of the other series in order to make the results comparable to Marston's results. The correlations between the two halves are, for the average of the boys' raters, .77 (reliability of .87 for the whole), and, for the average of the girls' raters, .82 (.90 for the whole). The rating scale is thus seen to have a rather high reliability.

The average correlation between the five boys' raters is .67 and the correlation between the girls' raters is .72.

#### INTROVERSION-EXTROVERSION IN RELATION TO AGE

The difference between the mean introversion-extroversion ratings for the ages  $13\frac{1}{2}$ -15 and 15- $16\frac{1}{2}$  is judged on the basis of the probable error of this difference in order to ascertain whether age influenced introversion and extroversion. The probable error of the difference between the two groups of boys is 2.19, and that of the two groups of girls is 5.02. In the case of the boys, the difference between the means is 6.3, and for the girls, 2.9. The ratio of the difference between the means to the probable error of this difference is 2.88 for the boys and .58 for the girls. Thus, in the former case, the difference between the two means probably bears significance since it is almost three times the probable error of the difference and indicates that extroversion is inversely related to age in the boys, while this is not the case with the girls. These two groups of boys comprise 61% of the entire group of boys, while these two groups of girls comprise 64% of the entire group of girls.

#### INTROVERSION-EXTROVERSION IN RELATION TO SEX

The ratio of the difference between the mean scores of the  $13\frac{1}{2}$ -15-year-old boys and the  $13\frac{1}{2}$ -15-year-old girls to the probable error of the difference between the mean scores was determined, to note the influence of sex

upon introversion; this was also determined for the 15-16½-year-old girls and the 15-16½-year-old boys. The probable error of the difference between the means of the 13½-15-year-old boys and the girls is 3.3 and for the 15-16½-year-old boys and girls, 4.3. The probable error of both differences is 3.8. The differences between the means are .2 for the 13½-15-year-old boys and girls and 3.6 for the 15-16½-year-old boys and girls. The ratio of the difference to the probable error of the difference is .05 in the first case and .95 in the other case. From these results, it may be concluded that sex has no influence on introversion and extroversion in these children.

#### INTROVERSION-EXTROVERSION IN RELATION TO OTHER TRAITS

Table 2 gives the raw intercorrelations between the ratings, chronological age, mental age, months committed, height and weight in both the boys and girls, and, in addition, between the mechanical ability scores and the

TABLE 2  
INTERCORRELATIONS BETWEEN INTROVERSION-EXTROVERSION RATINGS AND CHRONOLOGICAL AGE, MENTAL AGE, MECHANICAL ABILITY SCORES, MONTHS OF COMMITMENT, HEIGHT, AND WEIGHT OF BOYS AND GIRLS<sup>1</sup>

	I-E ratings <i>r</i> P.E.	Months committed <i>r</i> P.E.	Height <i>r</i> P.E.	Weight <i>r</i> P.E.	Age Chrono- logical <i>r</i> P.E.		Mental <i>r</i> P.E.
<i>Boys</i>							
Months commit- ted	— .29±.09						
Height	— .62±.06	.48±.08					
Weight	— .18±.10	.20±.10	.80±.05				
Chronolog- ical age	— .21±.10	.21±.10	.72±.06	.53±.07			
Mental age	.16±.10	.14±.10	.50±.08	.41±.08	.57±.07		
Mechanical ability scores*	— .08±.11	.89±.02	— .13±.10	.01±.11	.22±.10	.13±.10	
<i>Girls</i>							
Months commit- ted	— .38±.11						
Height	— .04±.14	.14±.13					
Weight	.13±.13	— .15±.13	.77±.06				
Chronolog- ical age	.01±.14	.29±.13	.18±.13	.32±.13			
Mental age	.24±.12	.40±.12	.35±.12	.49±.11	.67±.08		

\*Raw scores of Stenquist Mechanical Assembling Test, Form 1.

other traits of the boys. All the correlations of the traits with extroversion are rather low in both boys and girls. In the boys, all the traits except one correlate negatively with extroversion. This is significant in view of the previous conclusion that extroversion varies inversely with age in these boys. Partial correlations were computed, with chronological age held constant, between these traits and extroversion, to determine whether maturity played a part in the correlations mentioned above. Partialing out the age factor does not yield significant results, the partial correlations being, in the case of the boys,  $.35 \pm .08$ ,  $-.69 \pm .06$ ,  $-.08 \pm .11$  for mental age, height, and weight, respectively, and, in the case of the girls,  $.31 \pm .12$ ,  $-.04 \pm .14$ ,  $.14 \pm .13$  for these traits respectively.

There is probably no causal relationship between extroversion and mental age, height, and weight in this group of boys and girls.

#### SUMMARY AND CONCLUSIONS

1. The Marston Personality Rating Scale is employed in determining introversion-extroversion trends in 76 subnormal institutional children.
2. The reliability of the rating scale (ten items against ten others) is .77 for the boys and .82 for the girls.
3. A curve of the diagnosticity of the scale, trait by trait, reveals a striking similarity to the diagnosticity curve of the scale in Marston's study, indicating that the scale is most diagnostic and least diagnostic in the same traits for both subnormal institutional children and for more intelligent and more socially promising children.
4. A study of the 7 highest (extrovert) ratings and the 7 lowest (introvert) ratings and comparison with a similar study by Marston reveal the fact that this group of children inclined slightly more toward tendencies of introversion than Marston's younger subjects.
5. Marked individual differences appear among these children in introversion and extroversion, the ratings ranging from 33 to 90.
6. According to the ratio of the difference of the average scores of a group of younger boys and a group of older boys to the probable error of this difference, the older boys are more introverted than the younger ones. However, no influence of sex upon introversion and extroversion was revealed.
7. The Marston Personality Rating Scale proved to be a reliable technique in measuring tendencies toward introversion or extroversion in this group of institutional, subnormal children.

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## SOCIAL AGREEMENT ON PERSONALITY TRAITS AS JUDGED FROM SPEECH<sup>1</sup>

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### A. THE PROBLEM

It should be obvious that the speech of another person—along with his dress, mannerisms, physical build, and physiognomy—greatly influences our judgments concerning his personality. The mere “hello,” “thank you,” and “good-bye” of a telephone operator often give us quite complex notions of her personality. We speak of a radio announcer as cultured, egotistical, nervous, or whatnot, entirely apart from the content of his utterances. Psychologically trained persons are apt to take little stock in the validity of such judgments, but they are real, nevertheless. And just as studies of judgments from photographs have revealed the different degrees of social agreement in such judgments on various traits, as well as the general inaccuracy of all such judgments, a similar study might be expected to show the situation with regard to speech.

Pear's (1) study of voices as heard on the radio utilized a great many listeners, but few speakers, and was confined to judgments of a few traits, such as age, sex, occupation, and the section of England in which the speaker was reared. No other experiments of this nature have been reported in the literature.

This study confined itself to these three questions: (1) To what extent do people agree in ascribing a given trait to another, with speech as their only criterion? (2) How accurate are such judgments? (3) Are the traits on which more people agree also the ones which are judged more accurately?

### B. PROCEDURE

Twenty young men acted as subjects. Eight of these were from the least neurotic fifty (as judged by the Thurstone Personality Schedule)

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in the 1930-31 freshman class at the University of Chicago. Seven were from the most neurotic fifty, and five were upper classmen chosen at random. Each subject read a three-minute newspaper editorial on preparedness, and his reading was recorded on a Speakophone aluminum disk.

A questionnaire was prepared, consisting of 136 questions, statements, or words descriptive of personality traits. Thirty-two of these were from Freyd's list of introvert characteristics and 25 were from the Thurstone Personality Schedule. The remaining items were words commonly used to describe people. Each subject filled out this questionnaire, indicating by a "plus" sign every trait he thought he possessed, by a "minus" sign every trait he thought he did not possess, and by a question mark those on which he could not decide.

Each of the twenty records was then played to at least twenty auditors, who, after hearing a given record, filled out the same questionnaire, rating the subject whose voice they had just heard. Auditors were not permitted to use the question mark. Four hundred fifty-five questionnaires were secured from auditors.

### C. RESULTS

1. The first problem was to ascertain the degree of social agreement shown in judging personality traits, regardless of the accuracy of such judgments. The measure of the degree of social agreement was derived as follows, using item 1—"effeminate"—as an example: 35% of all the 455 auditors marked that item "plus." Taking 35%, therefore, as the mean chance expectancy for "plus" marks on this trait, the formula

$$\sqrt{\frac{pq}{n}}, \text{ or } \sqrt{\frac{.35 \times .65}{20}} \text{ gives the standard deviation or "spread" from}$$

35% of "plus" marks which chance would account for with twenty cases. If the actual standard deviation of these twenty cases whose mean is 35% is appreciably greater than that which chance will account for, then to that extent it may be assumed that the auditors were making a real discrimination. It would mean that, for a given trait, some subjects received a great many "plus" ratings, other subjects very few, and that these groupings were on the whole too marked to have arisen by chance. For item 1, then, the spread to be expected by chance is 10.66%, the actual spread is 27.46%, and the difference is thus 16.80%. To go one step further, this difference is 5.41 times its probable error; and at a superficial glance "effeminate" seems therefore established statistically as a trait on which there is a high degree of social agreement, when it is judged from speech. However, because of the small  $n$  of 20, any single

one of these critical ratios may be highly inaccurate, and the data seem hardly to justify any comparisons of the individual items of the questionnaire.

Table 1 presents a summary of the critical ratios for the 136 items, each computed as described above. These critical ratios represent the degree of certitude that the auditors made a real discrimination, not attributable to chance, between subjects with respect to a given trait. Thus, for example, the apparent degree of social agreement found in judging the best 72 items would be as low as the mean chance expectation less than once in a thousand times. It is clear that there is a marked degree of social agreement on many personality traits among judges whose only criterion is the subject's speech.

2. The second problem concerns the accuracy of these judgments based on speech, using agreement with subjects' self-ratings as the criterion. Three different measures of accuracy were employed.

a. It will be recalled that there was included in the questionnaire a short test of neurotic tendency, consisting of 25 items from the Thurstone Personality Schedule. Each of the twenty subjects has, therefore, two scores on this test: one from his own self-ratings, the other from the pooled ratings on these items of the twenty or more people who heard the record of his voice. The correlation between auditors' ratings and subjects' self-ratings on this test is  $+0.06$ . That this low relationship is not due to unreliabilities in the test is evident, since the reliability coefficient of the test is 0.99 when used by auditors, 0.94 when used by the subjects themselves. Clearly, there is no apparent relationship between a subject's own neurotic score and the score ascribed to him by people who judge him from his speech alone.

b. There was also a short introversion schedule of 32 items included in the questionnaire. The correlation between subjects' own scores and the auditors' ratings on this test is  $+0.03$ , indicating no relationship whatever. While there is definite social agreement that some voices ought

TABLE 1  
EXTENT TO WHICH AUDITORS' DISCRIMINATION EXCEEDS THE MEAN CHANCE  
EXPECTED DISPERSION OF JUDGMENTS

Number of items	Critical ratios
Highest 23	4.50 or over
" 55	3.75 "
" 72	3.00 "
" 88	2.25 "
" 111	1.50 "
" 121	1.00 "

to belong to introverts, such voices appear to be possessed as often as not by extroverts.

c. As a third measure of agreement between auditors' judgments and subjects' self-ratings, tetrachoric  $r$ 's were computed for 125 of the 136 traits. Insufficient data were available for calculating the other 11. The cells of the fourfold table were filled as follows: on the trait "effeminate," 35% of all auditors recorded "plus." Then if more than 35% of the auditors of Subject I marked him "plus," he was assigned a "plus" in the auditors' ratings; and if he marked himself "plus," he was recorded in the "plus-plus" cell of the fourfold table. These 125 coefficients ranged from  $+0.84$  to  $-0.82$ . The mean was  $-0.07$ , and the standard deviation 0.39.

From the mean of  $-0.07$  it is clearly evident that there was no general tendency for the auditors' opinion to agree with the subjects' opinion of themselves. The further question arises as to whether the high correlations have any significance. While the probable error of a number of these indicates them to be statistically reliable, the P.E. is itself so unstable with an  $n$  of twenty that 125 tetrachoric  $r$ 's may be expected by chance to vary almost as much as these did if the true correlation is zero.

However, it may be that these correlations are to some extent real and that traits are themselves widely distributed in the extent to which they are revealed by speech. That is, most traits may be very slightly revealed, some may be strongly revealed, while in still others the apparent significance of the speech cues may be quite misleading. But it must apparently be concluded from these data that, in general, when those who hear a subject's speech agree in ascribing to him a given trait, he himself is as likely as not to deny its possession. This clearly does not mean that in real life we cannot tell anything about a person by listening to him talk. It suggests that while under such conditions we do base personality judgments upon speech and voice, whatever accuracy such judgments may possess is contingent upon what the person says rather than upon the general characteristics of his speech and voice.

3. The third problem was whether the traits on which people agree best among themselves are also the ones on which they agree most with the subjects' own self-ratings. An "index of agreement" was devised to show to what extent the auditors agreed among themselves in their assignments of each trait, and these indices were correlated with the tetrachoric  $r$ 's. The coefficient thus obtained with  $-0.26$ , which is 4.5 times its probable error. There is thus a slight but statistically significant tendency for the auditors to be most consistent in their judgments when they agree least with the subjects themselves.

## SUMMARY AND CONCLUSIONS

1. There is clearly a high degree of social agreement in judging the personality traits of people with speech as the only guide.

2. Social judgments thus based on speech bear no relationship to the judgments of the subjects themselves so far as the present data are concerned. This is true of judgments of neurotic tendency and of introversion and of the mean accuracy of judgment of 125 diverse traits. The few cases of strong agreement or disagreement with subjects' self-ratings are probably not of great significance.

3. There is a tendency for the auditors to be most consistent in their judgments when they agree least with the subjects' self-ratings. It is at least clear that their degree of consistency in judging a given trait bears no positive relationship to their accuracy in judging that trait.

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## DISCRIMINATION: A STUDY OF SOCIAL DETERMINANTS

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In a previous paper, the writer (1) showed that social conditions affect the exclusiveness of judgments concerning peculiar persons in certain relations. Therein no attempt was made to differentiate the value of these factors. Using the same data, we shall now try to indicate how the weight of such predisposing circumstances can be measured.<sup>1</sup>

The original inquiry sought to find how students regard the admission of ten atypical personalities into ten different associations. If they admitted everybody to all these relations, their score was one hundred inclusions. If they rejected everybody, their rating was a hundred exclusions. Summing up a hundred such responses, we found nearly 6600 acceptances and more than 3400 rejections. In other words, the exclusive judgments of the group comprised about 34% of the total number of expressions. We, therefore, considered this average as the best representative figure to show how student opinion responded to the idea of

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<sup>1</sup>Seven of the original hundred data sheets were discarded, because of incomplete or doubtful entries. This elimination alters some of our previous results, but does not affect the main conclusions.



intrusion by "undesirables." Obviously, "inclusion" and "exclusion" are complementary terms, whose sum is 100 times the number of schedules enumerated.

We also obtained information about the personal background of our jurors, upon such points as are listed in Table 1. In classifying the

### MEAN VALUES OF FACTORS FOR EXCLUSION

(ARRANGED IN ORDER OF DIMINISHING DIFFERENCES)

AVERAGE FOR GROUP (ALL FACTORS) ----- 3.42=100%

CONDITIONS	NO HIGH FACTORS	AV	%AV	NO LOW FACTORS	AV	%AV	Δ%
RESIDENCE	78 ORGANIZED HOME	3.61	1.06	15 LODGINGS	2.43	.71	.35
POLITICS	28 REGULAR PARTY	3.95	1.15	65 INDEPENDENT	3.20	.94	.21
RELIGION	63 CHURCH MEMBER	3.56	1.04	30 NON MEMBER	3.14	.92	.12
FRATERNITY	50 MEMBER	3.53	1.03	43 UNAFFILIATED	3.30	.96	.07
SEX	47 FEMALE	3.53	1.03	46 MALE	3.32	.97	.06
SCHOOL	32 PROF. GRADUATE	3.55	1.04	61 LIBERAL ARTS	3.36	.98	.06
CONJUGAL	89 SINGLE	3.43	1.00	4 MARRIED	3.25	.95	.05
PARENTAGE	25 FOREIGN MIXED	3.54	1.03	68 NATIVE	3.38	.99	.04
AGE	40 22 YEARS +	3.50	1.02	53 -22 YEARS	3.37	.98	.04
OCCUPATION	71 STUDENT ONLY	3.44	1.01	22 BUSINESS	3.38	.99	.02

returns, we found that some of these categories were associated with a higher degree of exclusiveness than the corresponding subdivisions. For example, party members showed a larger percentage of rejections than did independents in politics. These facts suggested that social conditions may establish attitudes which are expressed in related judgments. It is to the sharper definition of such relations that this discussion is directed.

To find numerical values for 10 pairs of alternate factors considered, we group the returns in 10 pairs of equations. Each equation shows, in the left-hand member, the number of times one factor occurs alone, and in association with others of related classes. No expression of the alternate factor of the same class appears in this equation. The known quantity is simply the sum of exclusions registered by all persons belonging to the subclass so defined. We thus obtain 20 equations, each of which may contain as many as 19 variable quantities. Solving these equations, we have the results shown.<sup>2</sup>

<sup>2</sup>If we add the subclass equations, we find that the sum of scores equals 10 times the total number of exclusions registered by the group of 93 individuals. Likewise, the sum of all the unknown factors equals 10 times



What do these figures indicate? They indicate *for this group*:

1. That the private home, the political party, and the denominational church are strongholds of conservatism.
2. That differences of sex, age, and parentage are less important than they are frequently assumed to be.
3. That formal schooling, marital condition, and business interests are less influential in setting conventional opinions than are fraternal relations.

Some of these generalizations must be qualified with respect to the data upon which they are based. There is an unknown number of additional influences to which these individuals have been subjected, which are not included in our categories. Some of these may have been of greater significance than those enumerated. For instance, neighborhood conditions during childhood, character and extent of general reading, views of companions outside of the associations mentioned, may well have determined certain attitudes toward strangers. Obviously, the more of these conditions that are included, the more adequate will be our estimate of their relative importance. However, the mere attempt to enumerate all such circumstances will soon convince an investigator that the collection and calculation of statistical results for so wide a range of facts present almost insuperable difficulties. Extending our list and reducing the value of each factor might give the appearance of greater accuracy, but it probably would not greatly affect the ratios of the factors to their general average. Accordingly, our columns of percentages are more useful for comparison than the adventitious values upon which they are based. If we read the numerical values as percentile expressions of the attitude favoring exclusion in each subclass, we find them most significant. Thus our political partisans would debar nearly 40% of irregular applicants for admission to association with them; whereas the non-communicants in religion would reject only about 30% of the same candidates. Such differences seem important.

It may be considered questionable to include sex, age, and parentage

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the number of such instances recorded. Dividing the right-hand member of each equation by the sum of coefficients for the factor it represents, we have a mean value for that factor. Dividing the sum of scores by the sum of all the factors, we have the average value of any factor in the result. This simple method enables us to approximate directly the relative weight of factors in association. For so many variables, refined methods will be found to involve excessive time and effort. If more exact results are desired, these first figures can be substituted in the original equations, as described later. New mean values can then be calculated and used in repeated operations, until the results are further differentiated and stabilized.

with social conditions. Such factors are usually segregated as biological items, more or less independent of association processes. However, it is patent that the mere fact of being a native adult male permits one to enter into certain social relations which are absolutely closed to aliens, women and children—for example, most fraternities. It must be granted that such associations often pledge their members to maintain certain attitudes toward “outsiders.” Status and appropriate responses are thus established upon the basis of these inherent qualities.

It may be asked, further, whether quantitative results can be reckoned from these few scattering instances. Our reply is that the figures themselves are not important save as they indicate to other investigators how masses of data may yield definite and related statements upon points frequently accepted without analysis. Where the method of correlation cannot readily be applied, other mathematical devices may be employed. As to paucity of data, figures to the left of our columns of factors give the number of instances included and show how soundly the values are anchored by facts. Thus it appears that four married men give us slight basis for generalizing about the effects of matrimony. The reliability of returns for organized homes is seen to be more than twice that for rooming-house dwellers. However, it is less the adequacy of our results than the fact that we can find some clearly defined order among them which we wish to demonstrate. Social investigation suffers less from scarcity of data than from inadequate methods. We have plenty of verbal systems but few devices for testing our hypotheses. Some of our so-called “proofs” are merely collections of selected instances and occasionally amount to pure inference from analogy. Figures display the intrinsic strength or weakness of the case they support.

If we assume that the sum of the mean values of ten factors constitutes a norm, we can find the value of each factor in any individual equation by simple proportion.<sup>3</sup> Substituting in this way, we have 93 completed equations, showing the related weights of all the variable quantities in diverse combinations. Since we have no data concerning these individuals other than their scores in this test and the indications of their social connections, we can make no assertion about any one of them apart from the group. However, we can assign to each of them, and to the associations they represent, a definite value, based upon the performance under consideration. Further information would enable us to determine more accurately the representative character of such results.

If we arrange these individual equations in the order of magnitude of their scores, we find that they are composed of a series of overlapping

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<sup>3</sup>Each variable is to its mean value as the score is to a norm of like composition.

probability distributions of their several factors. That is, the integral of scores may be represented as the sum of the integrals of the factors, which approximate the form of curves of probable error.

The norms used in substitution are of some interest. Theoretically, 1024 combinations among 10 pairs of alternate elements are possible. Actually, we find only 68 different unions represented by our 93 instances. The fifteen combinations repeated comprise a total of 40 cases, from 2 to 7 instances being included under each identical arrangement. We find the scores of these instances well above the average of exclusiveness for the entire group, indicating, perhaps, a tendency of restricted social backgrounds to confirm conservatism.

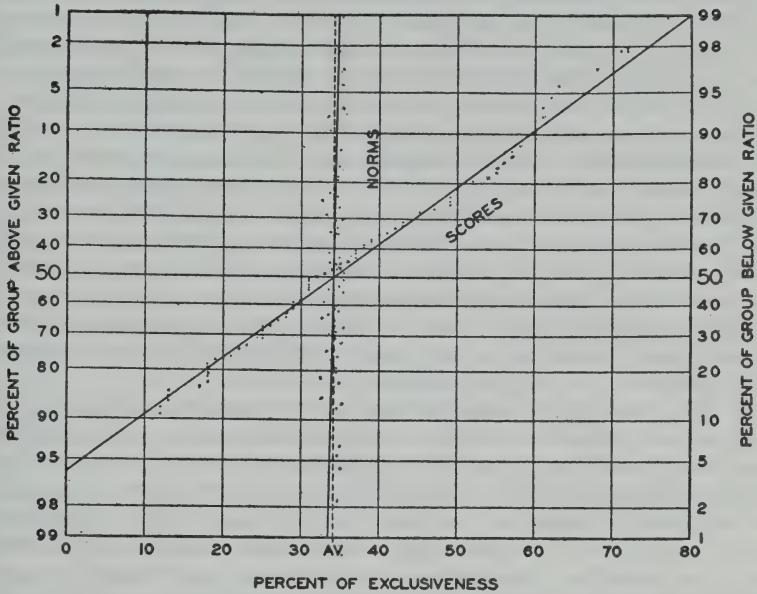
We should expect that the factors most numerous in our selected group would recur most frequently in combination. Thus, single persons (89) in organized homes (78) are the rule (74); whereas married men (4) in rooming-houses (15) do not appear on our list. But when 30 young women out of a total of 47 are found grouped under similar categories, as compared with 5 pairs of men from an almost equal number of cases, the probabilities are that we have to do with significant differences between the conditioning of the sexes. Even more marked is the ratio of concentration among those of native parentage as contrasted with those of foreign extraction (7:1). Here again we evidently have an indication of diversity in immigrant backgrounds.

So far as any one combination of circumstances is typical of the group as a whole, the norm is set by a modal aggregation of girls in Liberal Arts who live in organized houses, are church members, and have no regular business or political affiliations. This description gives a general idea of the prevailing influences that lie behind the opinions expressed. Our figures may help to define such forces more clearly.

In substituting values for the several factors in individual equations, we used the ratio of the score of each to a norm. This may be called a personal factor. It is the same for all the quantities in an equation. This artificial uniformity indicates that we are dealing with an average expression for a composite of variable quantities. Since we have no fixed scale of measurements for conditions or individual ability, it is practically impossible to determine how much of this quantity is due to social environment and how much to inherent qualities. We simply assume that it is probably the result of both and leave the development of scales and measurement to social investigators and psychologists. We are here concerned primarily with variations in its relative magnitude.

This individual factor also conforms to a probability integral. Its value ranges from a small fraction to more than twice the mean, indicating a positive skew. Its relation to scores and norms can be roughly gauged

PROBABLE RELATIONS  
BETWEEN SCORES AND NORMS



by the interval between their two curves in Figure 1. This graph, on arithmetic probability coordinates, shows at a glance (1) the positive skewness (greater right extension), (2) the accentuation of positions on the extreme right and left (deviations from trend), (3) the slight positive correlation between scores and norms (angle of slope), and (4) the greater regularity of norms among conservatives (less scattered in the upper 50%). So we have a general notion of the whole array and of the slight results of this analysis (which may be represented by the slender rift between average and norm).

In seeking a continuous variable throughout this group, we naturally considered the ages of its constituents, which are entered by years. Taking the 81 cases from 19 to 25 inclusive, we studied them more carefully to find how the condition of time is related to their judgments. We first adjusted their scores of exclusion by the norms for their social backgrounds, by simple proportion. We then found the average of these personal factors for each year of age. Plotting these, we obtained a positively skewed J-shaped curve, such as appears in mortality tables.



The turning-point is about 21 years. The typical norms for each successive year of age appear to increase rather evenly, so that the change of direction is not readily attributed to a reversal of social influences.

This rather unexpected result may be due to vagaries in our samples. If it reflects prevailing conditions, it might be ascribed to physiological development, as some psychologists seem to prefer. But why the opinions of youth should tend at first toward liberalism, and later toward conservatism, is not made clear by assuming that bodily functions at majority so rapidly produce opposed social attitudes. The environmentalist might easily rationalize the process by showing how students away from home at first lose touch with church and party, read disturbing books, and make new friends, until their former habits of thought and action are noticeably broken down. Then they begin to join societies, fall in love, and plan a career—all of which complications bring them into closer conformity with the established social order. I presume that much of this account is true; but I should like to know how to measure the process of change more accurately in terms of objective relations.

If it is a fact that a stream of young people dashes into the university, swings into a bright perihelion of intellectual emancipation, and then drifts back into a cold apogee of social convention, we should soon learn by repeated observations how to define that orbit. It may even be practicable to calculate (by means of a personal factor, a social norm as coefficient and a time index) the course a given individual is most likely to follow. It is not impossible. Meanwhile social statisticians must continue to collect more adequate data, and to experiment freely with mathematical devices for trying out their hunches.

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#### DENUNCIATION AND RELIGIOUS CERTAINTY

WARREN C. MIDDLETON

A study of religious leaders, reformers, revivalists, and cult organizers takes on peculiar significance for those students of social phenomena who have an especial interest in the socio-psychological aspects of denunciation. It is surely a matter of more than passing concern to those who have carefully observed the behavior of the religious revivalist ("evangelist," he is sometimes called) to discover that this particular type of religionist is,



for the most part, extraordinarily (perhaps abnormally) bombastic and denunciatory; for truly the typical evangelist goes about over the face of the earth like a "roaring lion." He has traditionally, regardless of time or place, exhibited verbal behavior of a strongly condemnatory character. The modern specimen is no exception; he is closely patterned after his precursors in this striking manifestation of the denunciatory characteristic. Most evangelists have, apparently, majored in denunciation and minored in acrobatics. They have, in general, been so condemnatory, both in their verbal and written utterances, that their carping language has become disproportionate to the positive and constructive elements of their message.

It is certainly not a gross exaggeration to say that a majority of the world's great evangelists and reformers have used denunciation as their chief weapon of offense and defense—the sword that cuts to the quick those who doubt them, are indifferent to them, or oppose them. The prophets of Biblical fame kept their "swords of denunciation" in razor-like form, prepared at all times to wage a holy war against those who were not on the side of Jehovah. In much the same manner, Girolamo Savonarola, Martin Luther, George Fox, and many of the world's great reformers have made rather effective use of denunciation; it was a part of their stock-in-trade. Denunciation was not even foreign to Christ Himself. He did not make use of mean invective, but he could use biting irony and "righteous indignation" to splendid advantage. The "good news" was generously spiced with denunciation; the gospel is here and there punctuated with, "Woe unto you, Scribes and Pharisees!"

There is perhaps nothing strange or mysterious about this characteristic tendency of religionists and reformers to be vituperative and condemnatory. We need not always interpret it as a sign or a symptom of abnormality, although in many individual cases the validity of this assumption is quite apparent;<sup>1</sup> nor need we characterize it as a perversity of temperament. Viewed psychologically, it would appear that much of the denunciatory behavior manifested by these individuals springs, basically and fundamentally, from their unusually intense feelings of religious certainty. It is not that their denunciatory temperaments are so abnormal; it is, rather, that their feelings of religious certainty are so extraordinary. Most of them possess an abnormally deep-seated awareness that they have the *only* valid religious authority, that God reveals Himself to them *directly*, and that they are, therefore, as near as were the apostles to the sources of divine revelation. A great many denunciatory religionists stoutly maintain that they have absolute mystical certainty that they have come into immediate at-one-

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<sup>1</sup>In the case of those personalities where denunciation has become chronic, the element of pathology is often easily analyzable. The author has made such an analysis in the case of the Quaker founder. Cf. (1, 2).

ment with the Divine. Consequently, their revelation comes clothed in supreme authority, a kind of absolute certainty that what has been revealed *must*, of necessity, be true. They conclude that God is working in and through them, and, consequently, they become as bold as lions, because they believe that "when God works none can hinder." It is in this peculiar attitude of mind that we discover the prophet complex *par excellence*. What was originally only an ordinary individual is now a prophet, through whom God is manifesting Himself to the world.

Many religionists of the more extreme mystical type maintain that they experience direct and immediate revelations from God, and when once a person can communicate with God in such a first-hand fashion surely the loftiest heights of religious certainty have been attained. All lesser forms of revelation can be spoken of not in the superlative degree but only in the comparative. Such immediate spiritual authority tends to confer upon the one who possesses it a tremendous amount of energy which manifests itself in extraordinary courage and fearlessness. "I can do all things through Him who strengthens me," says the apostle Paul. Jesus was dauntless because he spoke "with authority," and not as the Scribes and Pharisees. It was just this same consciousness of religious certainty that made the ancient Hebrew prophets so phenomenally intrepid.

The religious subject demands, psychologically at least, some kind of spiritual authority, and the more immediate and direct the authority the greater the feeling of trust and security. Absolute confidence in the revelation begets absolute respect and devotion. To be sure, devotees of different ages and of different faiths have relied upon different types of authority. The Catholics have always insisted upon the authority of the Church; the Protestants, upon the Biblical revelation. Mystics have not been contented with either of these forms of authority; they have sought, and they maintain that they have discovered, a more immediate revelation. This awareness of religious certainty that the mystic possesses tends towards causing him to conclude that he has something purer and better and more reliable than others. He often becomes rather reluctant, therefore, in recognizing the validity of the revelation possessed by other individuals.

When once a person concludes that he has the *only* pure and trustworthy revelation it is a very easy step for him to fall into that attitude of mind which will make all "lesser" forms of revelation appear petty and intolerable. When an individual comes to believe that he is in some way divinely inspired—just so soon as a prophet complex is firmly established—one can expect vitriolic denunciations to be spewed forth against multitudes of people.

As has been suggested throughout, religious evangelists and reformers have made very frequent use of denunciation. Absolute confidence in the infallibility of their religious authority has made this form of verbal at-

tack quite acceptable—perhaps in many cases quite unavoidable. The preponderance of denunciatory utterances in the discourses of most evangelists is evidence of the fact that their preaching bears all of the earmarks of mere vituperative criticism of the ways and doings of other individuals. The “thus sayeth the Lord” would appear to have given them special license to open their vials of righteous wrath for the benefit of few and for the discomfiture of many. The self-styled *Fundamentalists* are strongly inclined to be condemnatory and intolerant, because they are utterly confident that they have in “the Book” the only genuine religious authority. The unshaken faith that they have in a book that can be believed “from cover to cover” naturally provides them with an almost super-human reinforcement of fearlessness and boldness in their sharp condemnations of those who actually “tear whole pages from their Bibles.” This certainty of possessing “the faith once for all delivered unto the saints” seems in many instances to prepare a human organism to respond to certain stimuli by way of explosive behavior reactions. Extraordinary confidence in some religious revelation has helped to convert many a peaceful lamb into a howling denunciator, bold enough, if need be, to stand *contra mundam*.

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## A NOTE ON THE AGE OF MARRIAGE AND SIZE OF FAMILY OF TWO COMPARABLE VOCATIONAL GROUPS

SIEGFRIED E. KATZ AND ZYGMUNT PIOTROWSKI

One of us (K) gained the impression from his clinical material that fire plays a considerable rôle in the fantasy life of atypical children and psychopathic individuals. Children who suffer from occasional enuresis not infrequently tell of conflagration dreams and on waking find that they have wet themselves. A psychopath, age 37, who came to the attention of one of us (K) said that he set barns on fire and walked away a little distance and urinated. He was under the delusion that his action would put out the fire. It is not the object of this paper to go into detail with the analytical interpretation of such a mechanism. Suffice it to say that urination plays a considerable rôle in the sexual life of the male child and urination in itself becomes invested with sexual significance. It is interesting to

note here that the pyromaniac referred to above, although a man of 37, was entirely ignorant of the physiological function of sex. He was a hobo, roving through the country. On one occasion a friend of his suggested to him that he could earn an easy livelihood by breeding rabbits. He secured two rabbits; weeks passed without any results; he met his friend and told him of his plight. On his friend's inquiry, he learned that he had two bucks.

We are all familiar with the rôle that fire plays in everyday life. Let there be a fire alarm or engine passing and practically everyone will turn from his daily pursuit to watch the fire.

There is also a common superstition that children should not play with matches prior to going to bed as this occupation leads to bed-wetting.

It occurred to us that we might get further light on this subject by investigating the sex life of a vocational group in which fire is the predominating element, that is, city firemen. For obvious reasons one could not inquire as to their early dream life and the incidence of enuresis among the members of that group. However, opportunity presented itself to secure data on the marital status of 500 firemen. And as a control group, we chose the members of the police department. The New York Police Force and the New York Fire Department are recruited from a comparatively homogeneous social group—Irish-American. The requirements with regard to physical, mental, and moral qualifications are almost identical. The financial returns are the same, the age limits are identical, and the social milieu can hardly be differentiated.

#### METHOD OF STUDY

Through the cooperation of the heads of the police and fire departments, we were able to secure the following data on an unselected sample from both departments. The captains of two precincts and two fire stations gathered the material from men under their command. Data were secured from 485 policemen and 509 firemen on age of marriage, present age, marital status, and number of children.

#### ANALYSIS OF RESULTS

The data were treated statistically by one of us (P) and are presented in Table 1.

1. *Age of Marriage.* The average fireman is one year older at time of marriage than the average policeman. The difference in the mean age of marriage between both groups is significant, the mean being more than four times its probable error.

2. *Age of Unmarried Men.* The average policeman marries earlier than the average fireman. Therefore, the unmarried policeman is younger than



TABLE 1

	Firemen			Policemen			Difference	
	Average	P.E.	No. of cases	Average	P.E.	No. of cases	Average	P.E.
1. Age at marriage	26.049	.153	425	25.161	.142	372	0.888	.208 S.
2. Age of unmarried men	34.405	.407	84	31.356	.355	87	3.049	.540 S.
3. Present age	36.71		509	33.77		485		S.
4. Age at entering service	27.593	.117	425	25.210	.086	372	2.383	.145 S.
5. Percentage of men married at least one year before entering service (all included)	48%	.015	509	36%	.015	461	.117	.021 S.
6. Number of children per married man	2.127	.054	425	1.908	.057	349	0.219	.079 not S.
7. Age of father per child	38.924	.136	904	37.302	.204	666	1.622	.245 S.
8. Percentage of married men	84%	0.11	509	64%	.016	436	50%	.021 not S.
9. Percentage of men with children (unmarried excluded)	83%	.012	425	80%	.014	349	27%	.018 not S.
10. Percentage of men with children (all included)	69%	.014	509	64%	.016	436	50%	.021 not S.
11. Proportion of men married at least one year before entering service (unmarried excluded)	49%	.019	316	38%	.017	393	12%	.025 S.
12. $r$ between age at entering service and age at marriage	+ .23	$\pm .031$	425	+ .23	$\pm .033$	374	.001	not S.



the average unmarried fireman. The age for the fireman is 34.4, while for the policeman is 31.3.

3. *Present Age.* The age of the average duty fireman is three years more than that of the comparable policeman.

4. *Age on Entering Service.* The firemen are admitted to the force when they are more than two years older than the policemen. This economic basis may very well account for the difference in the delay in the average age of marriage. To check this point we computed the correlation coefficients between the age of marriage and the age of entering service and the proportion of men married at least one year before entering service. The correlation coefficients (Pearson's  $r$ ) is the same for both groups. (See item 12 in Table 1.)

5. *Incidence of Married Men Entering the Service.* Forty-eight per cent of the firemen married at least one year before entering service as compared to 36% of the policemen. The difference is statistically significant.

6. *The number of children per married man* is somewhat greater for the firemen than for the policemen, 2.12 and 1.91 respectively.

7. *The age of the father per child* was computed and we found the average age for the firemen was 38.9, while for policemen was 37.3.

#### INTERPRETATION

We find that the policemen enter service at an age two years younger than the firemen. This is probably not due to any intrinsic factors but due to the fact that during the past more men have been added to the police department than to the fire department. That might in part explain the discrepancy between the age of marriage between the policemen and firemen. The economic security would make it possible for the policemen to marry younger.

The number of children per married man is practically the same for the two groups.

#### CONCLUSION

This study would lead us to believe that the firemen's heterosexual adjustment is in no way different from that of a comparable group of policemen.

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## BOOKS

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CHARLES A. ELLWOOD. *Methods in Sociology: A Critical Study*. Durham, N. Car.: Duke University Press, 1933. Pp. 214. \$1.50.

Though there are many ways of classifying sociologists, one classification which specially interests the outsider is that which brings out their differences in the basic definition of their science. Sociologists have tended in recent years to divide sharply on the question of the importance of quantitative methods. A large and eloquent group makes the observation and manipulation of quantities the hall-mark of all scientific enterprise; in particular, they evidently mean that scientific sociology must treat persons as objects in time-space and that their behavior must be conceived after the manner of mechanics. Their antagonists have contended that social experience, social motives, social values must be given a central place in sociology if the external and observable time-space aspects of social contact are to be understood; counting such social contacts as pushes and pulls will get nowhere unless we know whether the pushes and pulls are hostile, playful, accidental, etc. The numbers and formulae derived from such data will have no meaning except in relation to social reality as we know, feel, and will it.

The distinction thus drawn lacks subtlety. There might be quantitatively minded sociologists who were chiefly interested in counting or measuring certain aspects of social *experience*, and devising quantitative laws of such experience; and there might be other sociologists devoted to an orthodox Watsonian behaviorism but lacking all interest in *measurement* of social interaction. In point of fact, however, behavioristic and quantitative methods are usually found together, and it is only among those who insist on the importance of social *experience* that the quantitative approaches are slighted or given a subordinate rôle.

Psychologists cannot help being involved in this dispute, since some of the earlier formulations of behaviorism accelerated the rise of statistical sociology, promising that a way would shortly be found to state social experience in terms of explicit or implicit muscular response—or even promising to systematize the domain of objective behavior study in such fashion that the problem of social experience could be dispensed with. The promise was assumed to be capable of such prompt fulfillment as to justify the belief that it had already been fulfilled. Psychologists are unfortunately responsible also in some measure for the prevalence of the view that quantitative and qualitative methods are mutually opposed; the belief that because experience shows qualitative variation, it must on that account be refractory to all mathematical approaches.

Ellwood's book seeks to make more explicit the claims of the "qualitative" group, finding a useful though subordinate rôle which may be played by the statisticians. The two most general sociological methods are, he believes, the historical and the psychological, the historical being essential in understanding the context or setting in which any social phenomenon appears, and the psychological giving the meaning which it has for those who participate in it. From this point of view, the cardinal virtue of the sociologist is thorough scholarship—scholarship in the sense of knowledge of all that has been observed and written in relation to one's chosen problem, and the capacity to reorganize and apply observational material in the formulation of hypotheses. For larger social trends a knowledge of history may be the chief requirement; for shorter time spans, as in the case study of individuals, emphasis will be on psychology. It is unlikely that anyone ignorant of his history or his psychology will be able to devise vital or significant hypotheses. On the other hand, the freshness and the acumen of the sociologist are by no means guaranteed by mere familiarity with the necessary observational material.

Quantitative methods, Ellwood evidently believes, are not applicable to history; they add something to the case study; but they are chiefly significant in special fields where problems of analyzing individual experience can be neglected; for example, studies of population trends and the influence of geography and climate upon material culture. Even where quantitative methods are valid, the laws to which they give rise are mere generalizations regarding special social trends and may at any time cease to have meaning as society changes. The curve for population growth or for the development of a new kind of material culture is, for example, useful in describing conditions in a given era and place, but it is common knowledge that these curves permit but little prediction, simply because new interests, tastes, inventions, and ideas change the basic trends and twist the curve into a new shape.

All this is stated lucidly. The necessity of a thorough analysis of qualitative problems is well described, and the demonstration that measurements are valuable only when the datum to be measured has been clearly defined is cogently made. Very little of the argument is new (the amount of quotation and citation of authorities is rather burdensome), yet to have this brief and clear statement of a viewpoint is most useful.

The book betrays, however, little awareness of the reasons why this type of argument seems inadequate to psychologists. Scanning their own science, psychologists know how easy it has always been to formulate vivid and appealing hypotheses, to "think out" the experiences and the values inherent in a situation, and how tremendously hard it is to give these hypotheses a testing so unambiguous as to convince their colleagues.

Ellwood tells us repeatedly that the validation of hypotheses lies in further observation, but he lays down no canons to tell us how these observations can be *forced* to verify or refute. In historical criticism, or even in biography, methods of work are now so definite that a single scholar may at times offer an hypothesis which all must sooner or later accept, but it is an open secret that in social psychology and sociology the master key of critical method has not yet been forged. We simply have not progressed far enough to know how to use new observations in the verification of hypotheses which have once been formulated. A glance over the last thirty years will show how easy it is to construct systems of psychology, and how impossible to construct one which will stand solidly against the testing which new experiments permit. And systems of sociology which have been thought out since the time of Comte have convinced their own originators year by year and decade by decade, have been abandoned, revived, and abandoned again, depending upon moods, economic conditions, fads in other sciences, and so on. Sociologists once worked out, in the comfort of their private studies, theories of human nature based on the seven primary instincts of the year 1908; they have now worked out, with equal coherence, systems based on the reflexes of the newborn and Watson's experiments on Albert in 1920. The output of sociological theories of this sort shows no tendency to decline. By failing to explain how sociological hypotheses are to be tested, Ellwood fails to touch the point which would chiefly interest the psychological reader.

Moreover, if it be true that the realities with which we deal are immediate social experiences, and if these experiences are so different from one man to another that the same social fact has a different meaning for the two, how can one man's hypothesis ever be tested by the second? The arguments offered by Ellwood and the group with which he wishes to affiliate himself show, if valid, that the testing of hypotheses must take on as many forms and give as many different results as there are attitudes of observing or attitudes in the testing of observations. If the inner world of private experience and motive is the true heart of the sociologist's problem, how is the sociologist's own personal world of motives and values to be exempted? How, with all the obvious differences in the emotional needs and wishes of social scientists, is anything like a coherent, acceptable, scientific body of data to be gathered and systematized? One may respect Hobbes, or Spencer, or Sumner, as an artist with many flashes of insight for which we may well be grateful, but the notion of science involves a corporate, social enterprise in which different workers can agree—at least as to major laws—and it must be evident that the thinking-out of sociological systems has as yet given no promise that a science is to be expected from that quarter.



Difficulties, however, arise, not only in finding a body of significant systematized data upon which sociologists can agree, but even in basing a single sociological system upon irrefutable facts. We have agreed with Ellwood for the sake of argument that questions of social behavior are basically questions of motive or value. But how does one ever know that one has plumbed the depths of the soul and set the motives in order as they really are? Psychologists admit, for the most part, that they know very little about the bases of social behavior even of themselves and their friends, those with whom they are in hourly contact; yet many sociological writers wish to define the motives of those who live thousands of miles away or who have been dead for a hundred years. They can tell us in detail of the psychology of the Italian Renaissance, the French Revolution, and the Chartist Movement, though they cannot grasp the psychology of the grocer's boy, or even that of their statistically minded opponents. Ellwood's argument is that sociology is based upon psychology, that is to say, a scientific psychology of motives; but there *is* no scientific psychology of motives. There are only fragments of data which the future will certainly regard as trivial. Let us by all means use all the psychology we have, even if much of it is the rough-and-ready psychology of uncontrolled observation, but let us not confuse this enterprise with the construction of the fundamentals of a science.

If Ellwood means that sociologists must do the best they can with the best results of a guess-work psychology of motives, no one can quarrel with him, for, indeed, there are urgent problems upon which it is better to guess than to remain silent. There is not only no harm in the venture of guessing about society, provided one recognizes that it is a guess; it may even suggest problems which can be tested by a reliable technique. It is very human and natural that psychologists and sociologists (and economists and anthropologists) who are working with these uncertain data should want the honorific title of "scientists," since in the twentieth century what is exact is more honorable (except among ultra-modern physicists). Yet it is equally natural that they should at the same time want the right to develop the groundwork of their chosen disciplines without embarrassment from measurements until they have some notion of what may profitably be measured.

In certain instances, e.g., the working-out of the idea of the "culture area" in anthropology, it has been necessary to define a concept carefully and to apply it in many situations before attempting to apply any quantitative tests. The concept of culture areas was put forward almost simultaneously with several other anthropological concepts which have now been abandoned. When first offered, this doctrine of culture areas was the crudest sort of idea. Only through further observation, largely of a rough



quantitative sort, has the validity of the idea been established. The quantitative testing in such cases is rarely a matter of "mathematics" (as in Clements' work); it consists mostly in noting resemblances and differences in the cultural elements of different ethnic groups. There are, indeed, some anthropologists who seem unaware that the grouping of such similarities and differences is the first step in all quantitative procedure.

But the mathematical method usually proceeds, of course, very much further than this simple grouping and counting of observations. There have been in recent years several brilliant analyses of quantitative data following upon thorough study of the qualitative sociological facts which are to be set in order. I refer, for example, to Rice's detailed statistical studies of the applicability of this notion of culture areas in his investigations of political attitudes (*Quantitative Methods in Politics*, 1928). There has been some discussion and some criticism of these studies by Rice, but, for the most part, the qualitatively minded group does not seem to have noted just what Rice was doing and how his work differed from the typical manipulation of numbers in population studies or the study of price indices in relation to the business cycle. A concept worked out in the course of anthropological field studies, was refined, thought through, and rendered applicable to American political life, and then, instead of being committed to the pages of a sociological treatise, was given a grueling statistical testing involving some thousands of correlation studies. A time will come when insistence on the minimizing of quantitative methods will seem reasonable only when one has acquainted oneself in detail with the nature of such enterprises and sets out to discuss in detail what has been done.

It is granted, of course, that sociology may in certain cases be able to verify hypotheses by methods other than those recognized in other sciences. It is, for example, quite possible that in the study of leadership certain qualities will be found significantly related to one another and to certain social consequences though no true form of *measurement* of such qualities has been suggested. Even here, however, one suspects that trouble arises in part from ignorance of the present state of statistical method. To make any *generalization* whatever about leadership involves quantitative method. To say that certain traits belong together usually or always, or that they are followed by certain social consequences usually or always, is to involve oneself in a mathematical generalization which can avoid the appearance of being mathematical only by remaining vague. To say that one quality goes with another quality is to make a statement which is useful just in so far as we are able to state how widely the rule holds and the conditions which make these two phenomena hang together; the first step in this process is to make observations under various conditions, testing the

variations in the results. I am not, of course, referring to product-moment correlations. There are many cases in which the interdependence of variables may be stated quantitatively though no variable can be independently measured. I refer to such commonplaces as the method of mean square contingency, especially devised to treat of the kind of problem which the sociologists have here in mind. Ellwood does not discuss such methods, or any of the many existing methods by which it is possible for the sociologist to *treat quantitatively* the relations which exist between *qualities*. If, of course, we had to measure *every* aspect of a phenomenon before the relation of this phenomenon to other phenomena could be stated quantitatively, we should have to postpone systematic quantitative sociology for decades, perhaps centuries. In none of the quantitative sciences which now exist, however, has it ever been found necessary to insist on such a criterion. In fact, it has been the rule rather than the exception that the quantitative *interrelations* between phenomena should be stated before the phenomena themselves are so stated. Psychology has witnessed for a hundred years a steady succession of such developments. Measurements of interrelations between phenomena have often led to a direct measurement of phenomena which had first defied all mathematical treatment. To give but two illustrations from contemporary work, the quantitative delineation of Gestalt psychology by Köhler and the mathematical conception of intelligence which has developed since Spearman's two-factor theory point to the constant improvement in definition of our problems as we work from the mathematics of interacting processes to the mathematics of the individual psychic act.

In summary, it seems to the reviewer that Ellwood's book states in cogent form the necessity of careful observation and a thinking-out of qualitative hypotheses regarding human nature and society before one attempts to collect numerical data. At the same time Ellwood seems to have no suggestion as to how laws of social interaction are to be verified without the use of quantitative methods. It is to be hoped that his next book will present the positive program of sociology as he sees it, with special reference to the problem of verifying sociological hypotheses.

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## SUGGESTIBILITY IN CHIMPANZEE\*

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The concepts of behavioral imitation, suggestibility, and social facilitation are intimately related; they belong to one family. Here they have been mentioned in order of increasing inclusiveness, for there can be no imitation of behavior without suggestion, and all effective suggestion appears as social facilitation. Whereas it is commonly asserted that primates are highly imitative of one another's behavior, the concepts of suggestibility and of social facilitation thus far have been applied primarily to man. The present status of knowledge suggests that this is due either to narrow-minded anthropocentrism or to anti-evolutional attitude, for it is definitely known that various types and examples of monkey, ape, and man, in certain stages of development and under appropriate conditions, are at once highly suggestible and, by imitation, exhibit the phenomenon of social facilitation. For chimpanzee, evidence in support of these statements abounds. Yet factual basis for quantitative comparison of primate types is lacking, and it is at present futile to assert that man is either more or less suggestible or imitative than monkey or anthropoid ape. This paper is presented as a report of a crucial test of extra-species suggestibility in chimpanzee.<sup>1</sup>

In this, as in all other aspects of psychobiological inquiry, impressions should speedily give place to observations, the conditions of which are arranged to facilitate control, describability, and quantitative expression of results. To achieve this ideal of experimentation, even imperfectly, in the study of social behavior is relatively difficult because of the complexity of phenomena, paucity of precedents, and the persistence of the superstition that social behavior cannot be studied experimentally. There exists a progress-inhibiting

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<sup>1</sup>The experiment was suggested by a procedure used in the Forsyth Dental Infirmary, Boston, under the direction of Doctor Percy R. Howe, to induce monkeys to eat cellulose.



conviction or wish which dies hard. Doubtless its disappearance will herald the effective extension of experimental procedure and ideals to the most complex phenomena of life. Although the procedure now to be described is imperfect, it at any rate is forward-looking and makes for objectivity, accuracy, and reliability of report.

In the interests of conclusiveness a stimulus was selected which seemed rather unlikely to induce positive response. Cellulose in the form of filter paper, a non-nutritious, and to chimpanzee as well as man seemingly a tasteless substance, was presented to the subjects in order to discover whether, if not otherwise, they might be influenced by human example or suggestion to accept and to eat it. A nutritious and sapid substance was not employed because it has many times been demonstrated in these laboratories that chimpanzees can be induced by human example to accept and to eat foodstuffs which they had previously refused.

Briefly, the essential conditions and procedures of experimentation were as follows: The experiment was divided into two parts: the one, preliminary and without suggestion; the other, with suggestion. On four successive days, just before the regular noon feeding,<sup>2</sup> a strip of filter paper approximately  $\frac{1}{2}$  cm. wide by 50 cm. long was offered to each subject through the wire netting of its cage. This portion of the experiment was preparatory to measurement of degree of suggestibility. Upon its completion, and for four successive days, as the experimenter offered a strip of paper to the subject he took one himself, and slowly, but with avidity, drew it into his mouth and chewed it noisily and with apparent satisfaction until the end of the period of observation which, unless the subject paid no attention whatever to the stimulus object, approximated three minutes.

The subjects were not deprived of food in preparation for the experiment and they certainly were not more than usually hungry. Doubtless a period of fasting would have favored and also enhanced the effect of example, but it also would have lessened somewhat the conclusiveness of what had been planned as a crucial test. Quite evidently degree of eagerness for food varied extremely among the subjects as well as from day to day.

It was considered preferable to leave the animals in their cus-

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<sup>2</sup>On the third day of the preliminary period, the temperature was unfavorably low and work was postponed until 2:20 in the afternoon.

tomary social relations rather than to isolate each for its test. No effort was made to prevent the subjects from watching one another. Species as well as extra-species suggestion consequently existed, but certainly the former was relatively inconspicuous by comparison. Although conditions of the experiment would have been simpler and more readily described had each subject been removed from its fellows, this procedure would have lessened somewhat the naturalness of the situation, and at the same time it would have deprived the experimenter of desired opportunity to observe the social relations and effects among companions. Here the remark is pertinent that, in our work with mammals, the endeavor to achieve describable conditions of experimentation not infrequently defeats our primary purpose by introducing inhibitions. Especially in the study of many aspects of social behavior in primates, at-homeness is absolutely necessary as a condition of activity.

All observations were made in out-of-door cages, with excellent illumination, and under eminently favorable conditions for stimulation, response, and recording. As the tests were made an assistant briefly recorded the characteristics of response and the experimenter at once assigned a numerical rating in accordance with the following system: A five-step scale was employed, in which the several values are thus definable: 0 = refusal to accept or prompt rejection of the paper, without carrying it to the lips or mouth; 1 = acceptance in hand or lips and placement in mouth, without active tasting or chewing; 2 = acceptance and chewing activity, without swallowing within the period of observation; 3 = acceptance, chewing, and, after delay, swallowing; and 4 = eager acceptance, chewing, and swallowing, as if with satisfaction. No ratings intermediate to these were employed.

The experiment was conducted at the Anthropoid Experiment Station of Yale University, Orange Park, Florida, in March, 1934. Twenty-one chimpanzees served as subjects. They are listed in order of increasing age in Table 1. The age range is from infancy to mid-maturity. Except for three individuals, Gamma, Beta, and Cuba, the date of birth is hypothetical, based upon morphological data. The number of males (four) is too small to permit of valid comparison of the sexes. Social groupings at the time of experimentation are indicated in the table by brackets and by footnote explanation. Highly important are the sexual stage and status of the subject; for each they are indicated briefly in the table.

TABLE 1  
LIST OF CHIMPANZEE SUBJECTS OF EXPERIMENT

Name	Number	Sex	Year of Birth	Sexual status
{ Gamma	58	Female	1932	Infantile
{ Beta	52	Female	1931	Infantile
{ Mamo	18	Female	1928	Adolescent
{ Al	9	Male	1928	Adolescent
{ Soda	12	Female	1927	Adolescent
{ Bentia	16	Female	1926	Nearly mature sexually
Nira	64	Female	1926	Sexually mature and in receptive phase during experiment
{ Cuba	46	Female	1926	Sexually mature
{ Bokar	5	Male	1925	Sexually mature
{ May	32	Female	1925	Sexually mature
{ Lia	56	Female	1924	Sexually mature
{ Mimi	44	Female	1923	Sexually mature
{ Wendy	4	Female	1923	Carrying an infant
{ Josie	30	Female	1922	Carrying an infant
{ Pan	3	Male	1922	Sexually mature
{ Nana	6	Female	1921	In seventh lunar month of pregnancy
Jack	17	Male	1920	Sexually mature
Dita	40	Female	1920	In eighth lunar month of pregnancy
Pati	42	Female	1920	Carrying an infant
Fifi	38	Female	1918	Carrying an infant
Mona	36	Female	1913	Carrying twin infants

Brackets indicate cage groups. All other individuals were alone, unless they carried nursing babies.

Table 2 presents the numerical results of the experiment arranged for convenience of comparisons. To permit age comparisons the total group of subjects has been divided into three subgroups of seven individuals each. The average ages for the subgroups approximate five, ten, and fifteen years respectively. At the bottom of Table 2 appear the total scores and the total of zero scores for each day and for the contrasted portions of the experiment. The curves of Figures 1 and 2 are plotted from these data. They exhibit the tendencies and some of the relationships which will now be described and discussed.<sup>3</sup>

<sup>3</sup>On reading this report in manuscript, Dr. Kenneth W. Spence became interested in ascertaining the reliability or consistency of the scores. He

Trial	Without suggestion				Total score	Av. score	With suggestion				Total score	Av. score
	P.1	P.2	P.3	P.4			S.1	S.2	S.3	S.4		
Group 1												
Gamma	2	1	1	0	4	1.00	2	2	1	1	6	1.50
Beta	2	1	1	0	4	1.00	0	3	2	4	9	2.25
Mamo	1	1	1	0	3	0.75	1	1	2	1	5	1.25
Al	1	0	1	0	2	0.50	0	0	0	0	0	0.00
Soda	3	2	2	2	9	2.25	2	1	1	0	4	1.00
Bentia	2	0	0	0	2	0.50	1	0	0	0	1	0.25
Nira	0	0	0	0	0	0.00	0	1	2	1	4	1.00
Totals	11	5	6	2	24	0.86	6	8	8	7	29	1.04
Group 2												
Cuba	2	0	0	0	2	0.50	0	1	0	1	2	0.50
Bokar	1	0	0	0	1	0.25	0	1	1	0	2	0.50
May	2	2	2	1	7	1.75	2	2	2	2	8	2.00
Lia	3	2	3	2	10	2.50	2	2	2	2	8	2.00
Mimi	3	2	3	3	11	2.75	1	2	2	3	8	2.00
Wendy	2	2	2	2	8	2.00	2	3	2	2	9	2.25
Josie	2	2	1	2	7	1.75	2	2	2	2	8	2.00
Totals	15	10	11	10	46	1.64	9	13	11	12	45	1.61
Group 3												
Pan	3	2	3	3	11	2.75	0	1	1	0	2	0.50
Nana	1	0	0	0	1	0.25	0	0	0	0	0	0.00
Jack	1	1	0	0	2	0.50	0	1	1	1	3	0.75
Dita	0	0	0	0	0	0.00	0	0	0	1	1	0.25
Pati	2	2	1	0	5	1.25	0	1	2	1	4	1.00
Fifi	1	2	3	3	9	2.25	2	2	3	2	9	2.25
Mona	2	1	2	2	7	1.75	1	1	1	0	3	0.75
Totals	10	8	9	8	35	1.25	3	6	8	5	22	0.79
Results for all subjects												
	36	23	26	20	105	1.25	18	27	27	24	96	1.15
Zero scores	2	7	7	12	28	.33	10	4	5	7	26	.31

There follows a running account of the chief characteristics and the assigned ratings of responses for the several days of the experiment.

Initially almost all of the subjects were curious about the situation, attended to the paper, accepted it in hand or lips, and gave it more or less thorough visual, gustatory, and tactual examination. Two females from the first responded negatively, pretty certainly because of their reproductive status. One of them, Nira, was in the sexually receptive phase of her periodic cycle, and the other, Dita, was in the eighth month of pregnancy. A third subject, Nana, who after the first day exhibited no interest in the filter paper, was in the seventh month of pregnancy. There can be no doubt from the results of this experiment that sexual status in chimpanzee profoundly affects many forms and aspects of behavior.

After the first day of preliminary work responsiveness to the paper diminished rapidly, as indicated alike by verbal descriptions of behavior and by numerical ratings, the totals for which ranged from 36 on the first day to 20 on the fourth. The frequency of zero scores increased from a total of 2 on the first to 12 on the fourth day of the preliminary portion of the experiment. Progress toward extinction of interest and toward complete inhibition of response was more rapid and pronounced in the youngest group (G1) than in either of the others. Intergroup influence also diminished steadily from the first day of the tests to the fourth.

In the second phase of the experiment, and with suggestion as a factor, attention of the subjects was concentrated and interest strong on the first day, but there was very little response to the paper. It appeared that the subjects were too much absorbed in watching the activity of the experimenter as he ostentatiously ate the filter paper to react to it themselves within the period of observation. Presumably, had that period been increased sufficiently, many of them would have responded. The average score consequently was low for the first day, lower in fact than for the fourth and last

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discovered that when the combined ratings for the odd days were correlated with those for the even days, for each experimental period, the following coefficients (product-moment  $r$ ) were obtained: for the preliminary period,  $.88 \pm .03$ ; for the suggestion period,  $.66 \pm .09$ . As Dr. Spence remarked in discussion of the data, these measures of reliability compare favorably with various measures obtained with human rating scales.



day of the preliminary test period (totals 18 versus 20). On the second day the subjects' attention tended to shift from experimenter to paper and response increased markedly. On this day it was obvious that with few exceptions the animals were influenced, by the example of the experimenter, to taste and to chew the paper, but rarely to swallow it. On the third day of the test there was convincing evidence of waning attention, although as it happened the total score for responses continued unchanged. Response decreased on the fourth day, and it then was evident that human suggestion alone would not suffice to induce the chimpanzee to accept and eat the strips of filter paper. Total and zero scores tell the same story of initial reinforcement of response, followed promptly by lessening of attention and diminution or disappearance of response.

Clearly extra-species suggestion in this experiment commanded the attention of the animals, greatly increased their interest in the stimulus object, and induced them to reexamine and chew it tentatively, and, as it were, experimentally. In only one instance did the experimenter's example suffice to elicit prompt acceptance and eating of the unwonted substance, and that in the two-and-a-half-year-old infant Beta.

The curves of Figures 1 and 2 exhibit rapid lessening of response

Zero scores

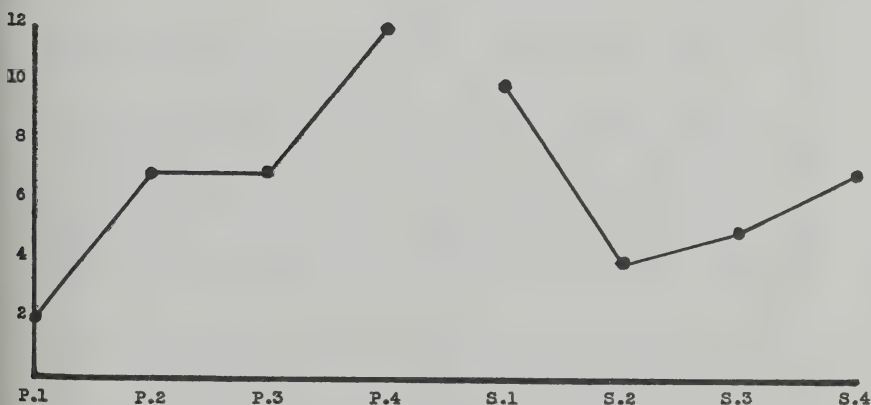


FIGURE 1

TOTAL SCORES FOR PRELIMINARY TESTS WITHOUT SUGGESTION, P.1 TO P.4,  
AND FOR TESTS WITH SUGGESTION, S.1 TO S.4.

Total scores

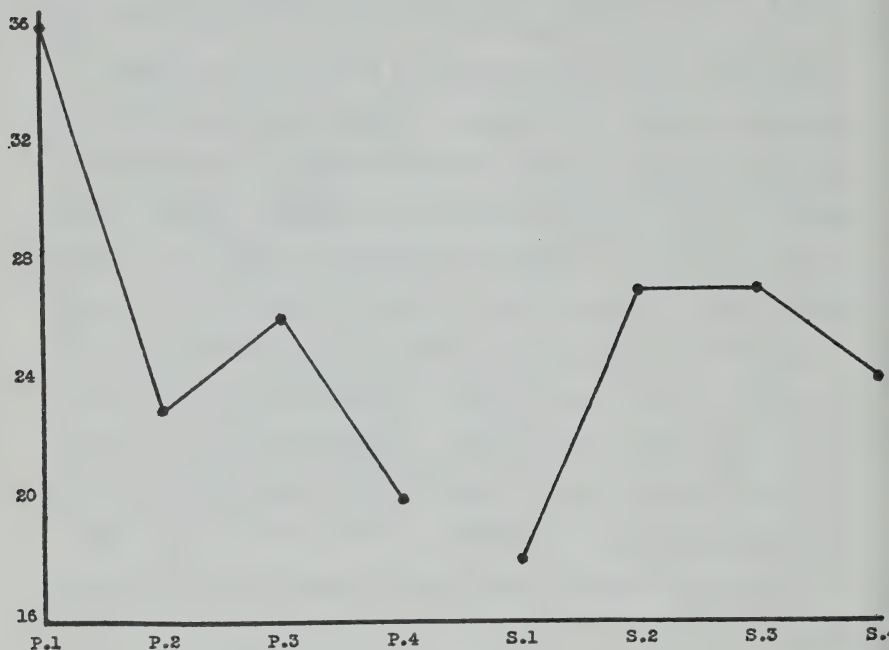


FIGURE 2

FREQUENCY OF ZERO SCORES FOR PRELIMINARY TESTS WITHOUT SUGGESTION, P.1 TO P.4, AND FOR TESTS WITH SUGGESTION, S.1 TO S.4

as measured by daily total and zero scores during the first phase of the experiment (without suggestion), and pronounced increase in response, subsequently followed by lessening, in the second phase of the experiment (with extra-species suggestion). The results, both qualitative and quantitative, support this general statement, and they definitely establish the fact of extra-species suggestibility in the chimpanzee.

Among the behavioral trends and relations which are either definitely established or strongly suggested by the results of this experiment, the following seem especially worthy of remark.

Under the conditions of observation, initial curiosity tends, with repetition of stimulation and whether with or without suggestion, to approach extinction. In other words, the chimpanzee investigates

the stimulus, tentatively follows the experimenter's example, and, finally, with a degree of promptness and independence which depends upon age, sex and sexual status, hunger, and relation to the experimenter, acts in accordance with the results of its experience.

To see the experimenter eat strips of filter paper, a substance which the chimpanzees previously had tasted and had found wanting in flavor, evidently surprised and greatly interested them. At first most of them acted as if spellbound, gazing fixedly at the source of suggestion. Later several of them exhibited impatience as the paper was held out to them, and in not a few instances they finally came to resent this act of the experimenter as if impositional, and they would take the paper, after delay and with evident reluctance, from the hand of the experimenter and cast it aside, as if to have done with the job and to abate the annoyance. Yet other individuals, when the suggestive influence of the stimulus had waned, took the paper promptly and played with it by draping it over the head, about the neck, or by tearing it into bits. Another form of amusement which was observed frequently in the preliminary phase of the experiment, and occasionally in the suggestion phase, was the moistening of the dry absorbent substance with saliva, rolling it into a wad in the mouth, and stuffing it into a nostril. It then would promptly and repeatedly be blown out or withdrawn by the fingers; sometimes extraction proved difficult and the animal seemed somewhat annoyed. In a few instances strips of paper were used, handkerchiefwise, to wipe the nose or face. As a rule those subjects which accepted and chewed the paper shortly dropped it from the mouth, looking like a spitball, and paid no further attention to it.

In general, the relation of suggestibility to age and the developmental status in chimpanzee appears to resemble that in man. The present results seem to indicate that, whereas suggestibility is relatively slight in early infancy, with development it increases rapidly to a maximum and then wanes. It was markedly less, for example, in the 18-month infant Gamma than in the 29-month infant Beta. Tentatively, the generalization may be suggested that it attains its maximum in late infancy or early childhood and thereafter diminishes. There are evidences that negativism appears in some adults. The data of this particular experiment are too few to establish the nature of the age relationship, but they clearly enough indicate dependence of suggestibility upon developmental status.

The significance of age is indicated also by the fact that ordinarily the younger ape awaits the response of an older or dominant individual before reacting to a novel situation such as this experiment presented. Four subgroups of subjects with definiteness exhibited this social relationship: Gamma watched and waited for Beta to respond, and thereupon followed her example. Al sat before and intently watched Bentia while she initially examined and tasted the filter paper. Likewise, Mamo closely observed Soda and responded to the novel stimulus only after the latter had completed her examination and tasted the substance. May and Lia watched and observed the behavior of Mimi; she was the dominant member of the trio of mature females. The nursing infants watched their mothers and only subsequently strove to obtain pieces of the paper for themselves. Two of the six infants in arms were too timid to take any initiative and merely observed what happened about them. The six nursing infants above referred to have not been included in the list of subjects because they could not be tested experimentally prior to weaning. Their behavior has been reported only incidentally.

From what has just been reported it is evident that dominance, and also superior age, imply responsibility. Should a novel situation prove harmful, the dominant member of the social group, or the older individual who takes initiative in examination, exploration, or experimentation, inevitably suffers first, if not alone. We are prone to think of primate leadership, among monkeys and apes as well as among ourselves, as primarily a matter of privilege and power; it may as appropriately be viewed as obligation and personal hazard.

The extreme importance of sexual stage and status in relation to social stimuli and their effects on chimpanzee has already been mentioned. The subject merits further consideration, for there can be no doubt that in their use of mammalian subjects many physiologists and psychobiologists ignore the fact. The chief points relative to this matter which appear in the results of the present experiment may thus be reformulated: (1) The value of social stimuli and situations for chimpanzee is markedly affected by sexual receptivity in the female (a limited period within the five-week menstrual cycle), and by sexual potency, desire, interest, and excitement in the male. (2) Pregnancy renders an animal relatively indifferent to

certain social stimuli (suggestions), which otherwise might induce positive response. In the present experiment this aspect of effect may have been due chiefly to dietary requirements. If so, the matter is the more important, since in many psychobiological experiments food is relied upon for motivation. Pregnancy, it appears, may greatly lessen or even destroy the motivational value of unfamiliar substances, or even of foodstuffs which ordinarily would be desired.<sup>4</sup>

(3) The lactating and nursing female tends to exhibit more interest in unfamiliar substances which promise to be edible than would appear under other circumstances. Her behavior is the opposite of that of the pregnant individual, for the one seeks the novel substance as a possible foodstuff, the other ignores or avoids it. The observations which have been reported prove the desirability of definite knowledge.

Finally, the results of this test of suggestibility indicate that the social relationship which exists between experimenter and subject importantly influences response. The more intimate and prolonged the acquaintance and the stronger the chimpanzee's attachment to and confidence in the experimenter, the greater the suggestibility. Quite evidently interest, sympathy, confidence, even in the case of chimpanzee, significantly condition social facilitation. Were it possible to translate these terms from psychological into physiological, assuredly I gladly should do so!

For students of primate life, including the students of man, whether their interests be in problems of physiology, pathology, psychology, or sociology, it would be difficult to exaggerate the theoretical and practical importance of social facilitation, suggestibility, and behavioral imitation. Years of study of the chimpanzee, in the midst of which the experiment here reported appears as an incident, have provided varied and convincing evidence that suggestibility and behavioral imitation are among its most important behavioral characteristics or capacities. They serve to condition individual development and adaptation and to constitute a basis for the accumulation of experience and the growth of social tradition.

As psychobiologists we are in the early stages of a quest for basic information about the essential facts and conditions of primate behavior, the results of which already threaten to revolutionize many

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<sup>4</sup>It would be rash to assume that such statements as these do not apply similarly to rats, cats, dogs, and other commonly used laboratory mammals.



of our conventional notions about methods of animal experimentation, to destroy some of our cherished assumptions and superstitions relative to genetic relations, and to force us, whether we like it or not, to take into account in our studies of the organism as a functional whole many facts which we have persistently ignored or denied. It is to be hoped that this prospective revolution through enlightenment may have the beneficent effect of bringing physiology, psychology, and sociology together as experimental observational discipline.

### LA SUGGESTIBILITÉ CHEZ LE CHIMPANZÉ

#### (Résumé)

Pour mesurer la suggestibilité en dehors de l'espèce chez le chimpanzé, on s'est servi de vingt-et-un individuels, âgés entre l'enfance et la maturité. Premièrement on les a observés systématiquement pour savoir s'ils accepteraient et mangeraient des bandes de papier filtre sans saveur sans suggestion. Les résultats ont été négatifs. Ensuite on a introduit la suggestion: comme l'expérimentateur a donné une bande de papier au sujet, il en a pris une lui-même et l'a mangée avec avidité. On s'est servi d'une petite échelle d'évaluation dans la description quantitative de la réponse. On a démontré la suggestibilité en dehors de l'espèce. On a constaté que celle-ci varie avec l'âge, le stage et l'état sexuels, et l'intimité de la relation entre le sujet et l'expérimentateur. Un seulement des vingt-et-un sujets, une femelle âgée d'environ deux ans et demi, a été causée par la suggestion d'accepter et de manger le papier avec facilité.

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### SUGGESTIBILITÄT BEIM SCHIMPANSEN

#### (Referat)

Um die Extragattungssuggestibilität beim Schimpansen zu messen, wurden einundzwanzig Tiere von Kindheit bis zur Halbreife gebraucht. Zunächst wurden sie planmässig beobachtet, um zu entdecken, ob sie ohne Suggestion Streifen unschmackhaften Filtrierpapiers annehmen und fressen würden. Die Ergebnisse waren negativ. Darauf wurde Suggestion eingeführt. Als der VI. dem Tier ein Stück Papier reichte, nahm er selbst eins und ass es gierig. Eine einfache Wertskala wurde in der quantitativen Beschreibung der Ergebnisse angewendet. Extragattungssuggestibilität wurde bewiesen. Es wurde gefunden, dass sie mit dem Alter, sexuellem Stadium und Zustand, und mit der Vertraulichkeit zwischen dem Tier und dem VI. variierte. Nur ein Tier aus den einundzwanzig Tieren, ein Weibchen ungefähr zweieinhalb Jahre alt, wurde durch Suggestion veranlasst, das Papier bereitwillig anzunehmen und zu fressen.

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# MULTIPLE-FACTOR ANALYSIS OF GENERALIZED ATTITUDES\*

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## A. INTRODUCTION

It is recognized that the personality of a single individual is an integration and not a mere summation of attitudes and other personality traits. But what points of similarity exist among the personality organizations of different individuals? What factors are common to the attitudes of a number of persons? This problem is and has been recognized to be vital. The unique feature in this investigation is the application of statistical multiple-factor techniques to the problem. General attitude factors are found which are involved in varying degrees in different items.

In the field of personality, at present, the study of particular attitudes is extremely common. The studies are often quite narrow in scope, being limited to the investigation of such variables as international-mindedness, religious conservatism or radicalism, attitudes toward fraternities, etc. Such studies are not to be disparaged if they bring out significant group differences, but one may well be skeptical of the general fruitfulness of this approach. When one attitude is studied in one population and a second attitude in another, there is no way of knowing how the attitudes are related. The cumulation of studies of particular attitudes, without inquiry as to whether they are independent or overlapping, does not constitute a survey of personality. There can be no comprehensive survey without a system of triangulation.

There are a number of systems which take some considerable part of personality and separate this into subdivisions which are mutually distinct and together exhaust the subject. Thus, Spranger (5) finds six basic values—theoretical, economic, political, esthetic,

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social, and religious—while McDougall (3) and others find underlying all behavior a number of discrete instincts.

The various systematizers are to be commended for recognizing that the only means of bringing order into psychology is the establishment of basic factors. But since the investigators have individual standards there is much disagreement as to what factors are basic.

### B. STATISTICAL FACTOR METHODS

Statistical factor techniques offer a way of obtaining factors which are more generally valid. The wider validity results from lessening the scope of personal bias. The method is fixed; it can be repeated, if desired. Since the critic is given the items and the factor weights of the items, he can estimate the personal bias involved in the construction of the items and the interpretation of the factor patterns. By the use of statistical techniques, factors can be isolated which:

1. are independent;
2. exist in varying strengths in different persons;
3. are manifest in varying degrees in different situations, e.g., in the responses to different questions.

The factor strength of an individual and the factor weight of an item can be measured.

Methods for the isolation of factors were first developed in the analysis of ability. The leading person was Carl Spearman (4), originator of the theory of general and specific abilities. Spearman's method is particularly appropriate when among the factors involved one is markedly dominant and is manifest in a much wider range of items than the other factors. Variants of the approach used by Spearman have been developed by Kelley (2) and Thurstone (7). These are explicitly designed as multiple-factor techniques and are most appropriate when among the factors involved no one is dominant.

Thurstone's technique is used in this investigation. The method is extended to a new field, that of generalized personal attitudes. The method was previously used by Thurstone (8) in the analysis of vocational interests. Four interests, business, people, language, and science, were shown to be involved in E. K. Strong's table of intercorrelations of occupational interests. For a summarized statement of the mathematical technique see Thurstone (7, pp. 422-425).

## C. ATTITUDE QUESTIONS: CONSTRUCTION AND APPLICATION

In order to investigate attitude variables a number of questions were drawn up. (See Table 1 for examples.) For each question there are three blanks. A rough measurement of the attitude is given by the checking of one of these.

TABLE 1  
QUESTIONS ON PERSONAL ATTITUDES

*Instructions:* Take the words used as roughly indicating a threefold scale into which responses to the question may be put. The scale refers to your judgment of yourself, not to what you think other people's judgment may be. Consider each question carefully, but if in doubt as to the proper checking, guess.

*Abbreviations used:* *M*, much; *S*, considerable or somewhat; *L*, little or none; and *F*, frequently; *S*, sometimes; and *R*, rarely or never.

1. How much would your liking for an acquaintance of the same sex be affected by whether that person had a genuine liking for and interest in children or was indifferent?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

2. How much change has there been in the last two years in the type of people you prefer and seek to associate with?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

3. How much enjoyment do you get out of doing or saying things which are quite shocking to most of the people who see or hear you?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

4. How much enjoyment do you get out of working with materials or making things with your hands?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

5. To what extent, in general, is your evaluation, judgment, and opinion of an acquaintance of the opposite sex based on speculation and thought as to how satisfactory the person might be as husband or wife?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

6. To what extent are you interested in politics? (That is local, provincial, national, or international politics?)

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

7. How much do you differ from your intimate friends in likes, dislikes, tastes, interests, etc.?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

8. How much fluctuation is there in your attitude towards the total situation you find yourself in? (Do periods in which you are extremely bored with everything alternate with periods in which you find many things interesting and life as a whole quite enjoyable or does your interest in things and your enjoyment of life run at a fairly even level? Ignore fluctuations which occur weekly. Consider only fluctuations extending over several weeks.)

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

9. How much do you think about the effect of your actions on the lives, thoughts, and actions of others?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

10. How much do you enjoy the use of language, either in writing or in speaking, for its own sake?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

The following questions refer to a situation in which you are a spectator. How much is your interest in a play or drama affected by,—

11. The extent to which a conflict of individual wills, a conflict of personalities, occurs?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

12. Whether or not the characters are unconventional and violate established customs and codes of behavior?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

13. Whether the situations portrayed are realistic and sordid or are an improvement on and exception to most of life?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

14. Whether or not right triumphs?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

15. Whether or not strong emotions are displayed?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

16. A habit of comparison of a given play with others or of criticism according to some standard which you have as to whether plays are or are not good?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

The following questions deal with things which may be liked and enjoyed without a great deal of thinking about them. Indicate how much you enjoy these.

17. Spicy and highly seasoned foods?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

18. Moderately strong cold winds? (Perhaps between zero and freezing, Fahrenheit.)

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

19. As a passenger, very rapid movement, for example in an automobile, train, motorboat, etc., movement at a speed which some people consider scarcely safe?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

Certain problems seem important to many people. Indicate on the three-fold scale the degree to which the following problems are vital to you.

20. Of waste versus efficiency in the economic and social system: in the making and distribution of goods, in the placing of men in jobs, etc.?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

21. Whether man's actions are wholly determined or whether man is to some extent free to choose what he will do?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

22. The extent to which force is ever justified in settling disputes between individuals and between nations?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

23. Whether the modern industrial and machine age limits and dulls most people's appreciation of beauty?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_

24. The duty of the individual to society?

M\_\_\_\_\_ S\_\_\_\_\_ L\_\_\_\_\_



The following questions are answered by checking F, S, or R.

25. How frequently do you worry?

F\_\_\_\_\_ S\_\_\_\_\_ R\_\_\_\_\_

26. How frequently do you think about the meaning of life?

F\_\_\_\_\_ S\_\_\_\_\_ R\_\_\_\_\_

The following questions are answered by checking a word or phrase.

27. In hearing a lecture from a person you do not know very well, or in reading a newspaper or magazine which you rarely read, how sceptical are you, to what extent are you suspicious that you are being exposed to propaganda?

Very critical\_\_\_\_\_ Moderately critical\_\_\_\_\_ Don't usually think about it\_\_\_\_\_

28. During the last five years, what change has there been in the frequency and amount of day dreaming which you do?

An increase\_\_\_\_\_ Little change\_\_\_\_\_ A decrease\_\_\_\_\_

29. To what extent do you prefer working with people to working with things? Much prefer working with people\_\_\_\_\_

Like both about equally well\_\_\_\_\_

Generally prefer working with things\_\_\_\_\_

30. Do you like or dislike being waited on? (By shoe-blacks, porters, waiters, servants, etc. Do you like the attentions of such people?)

Like being waited on\_\_\_\_\_

Quite indifferent\_\_\_\_\_

Dislike the attentions of such servile people\_\_\_\_\_

31. How large is the group of persons whose respect and approval you seek to secure?

Large\_\_\_\_\_ Moderately large\_\_\_\_\_ Small\_\_\_\_\_

The criteria used for selecting the questions were:

1. Adequate sampling. Generalized questions were used in order to touch a wide variety of attitudes with a fairly limited number of questions. Specific questions such as characterize Strong's (6) Interest Inventory touch only narrow situations. As good a sampling is obtained with a fair number of generalized questions as would be obtained with a large number of specific questions.

2. In order not to receive stereotyped answers, questions which would antagonize the subject or which have conventional right and wrong answers were avoided.

The raw data were derived from questionnaires filled out by 126 undergraduates, 78 female, and 48 male. The median age of the subjects was twenty. The subjects were not asked to sign their names. The subjects seemed both interested and conscientious.

Sixty-three questions were given. Only 46 were used in the calculation. These passed an arbitrary standard of sufficient variability—not over 60% and not less than 10% of the subjects checked any one blank. (For frequencies in the several blanks see Table 2.)

TABLE 2

Item	Weights of Factors A, B, C, D, E, and F in the items					Response frequency in blanks 1, 2, and 3*			
	A†	B	C	D	E	F	1	2	3
1.	+35	+03	+06	-.64 (3)	+.04	-.08	19	41	66
2.	-.07	+37 (8)	+13	-.60 (5½)	+.03	+.23	30	37	59
3.	-.13	+40 (6)	-.03	-.22	+.35	+.11	16	38	72
4.	+28	-.21	+37	+.85 (1)	-.46 (6½)	+.01	50	51	25
5.	+43 (5)	+02	-.14	-.03	-.43	+.46	26	53	47
6.	+20	-.24	+26	+.62 (4)	+.49 (5)	-.05	29	55	42
7.	-.23	-.34	+14	.00	+.44 (8)	-.15	18	59	49
8.	-.30	+49	+38	-.07	+.13	-.39	35	33	58
9.	+47 (3)	-.11	-.09	+.08	-.03	+.50 (7)	38	61	27
10.	+19	+59 (2)	+18	+.21	-.03	-.44	39	59	28
11.	+03	+12	+.84 (1)	-.71 (2)	-.01	-.74 (3)	63	47	16
12.	+25	+27	+15	-.60 (5½)	+.60 (2)	-.26	42	40	44
13.	+42 (6)	-.10	+17	+.07	+.10	-.10	53	47	26
14.	+78 (1)	-.35	-.39	-.38	+.12	-.17	44	33	49
15.	+45 (4)	+35	-.18	-.21	-.01	+.29	58	35	33
16.	+40 (7)	+38 (7)	+19	+.38	-.26	+.15	38	45	43
17.	-.20	+28	+06	.00	-.59 (3)	-.11	24	55	47
18.	+09	+19	+47 (6)	+.25	.00	-.02	37	47	42
19.	-.09	+36 (9)	+09	+.36	+.14	-.17	72	39	15
20.	+19	+02	+42 (7)	+.21	+.18	-.04	63	43	20
21.	+02	+29	+22	+.57 (7)	-.37	+.67 (4)	58	44	24
22.	-.03	-.02	+48 (5)	+.17	+.11	-.06	68	34	24
23.	+04	-.19	+59 (2)	-.16	+.13	-.15	38	48	40
24.	+62 (2)	-.20	+28	+.19	+.11	+.12	54	37	35
25.	-.30	+47	+02	-.06	+.06	+.23	45	58	23
26.	-.11	+35	+26	+.23	-.66 (1)	+.57 (6)	67	46	13
27.	-.07	-.05	+.51 (4)	-.03	+.15	+.94 (1)	16	58	52
28.	-.18	+21	-.10	-.44	+.46 (6½)	+.01	36	53	37
29.	-.09	+48 (4)	-.05	+.16	+.51 (4)	-.77 (2)	63	50	13
30.	-.01	+83 (1)	-.54 (3)	+.47	-.31	+.22	47	57	22
31.	+38	-.29	-.09	-.42	+.33	+.45	36	47	43

\*Note: The ranks are numbered 1, 2, 3, in order from left to right and from top to bottom.

†Note: The number in parentheses is the rank order of the item in the factor.

#### D. METHOD OF CALCULATION

The range of measurement possible with attitudes necessitated certain changes in the method. Attitudes can be measured only roughly. The response to each question is on a threefold scale.  $3 \times 3$  frequency tables were drawn up for all the pairs of items. Coefficients of mean square contingency were found.

To determine whether a coefficient was plus or minus, the  $3 \times 3$  table was turned into a  $2 \times 2$  table in such a way that the sum of the frequencies in each two quadrants in the same row or tier was half the total. The total frequencies in the two diagonals were then compared.

The use of contingency coefficients and the affixing of plus and minus signs to these is a weakness in the method as it introduces certain errors. However, the errors in the coefficients being independent, some compensation of errors is to be expected in the additive steps of the analysis.

In applying the multiple-factor method to the obtained table of intercorrelations, (*a*) self-correlations were taken as unity, and (*b*) no item was used as a pivot for a group unless the coefficients between it and all preceding pivots were less than .40.

The results of the analysis, the weights of the factors in the items, are given in Table 2. The factors are lettered in order of isolation. Six factors are given—a weight greater than unity was found in the seventh factor. Because of the cumulations of errors the factor weights in the latter factors are less reliable. Consequently one cannot have the same confidence in all the factor patterns.

#### E. INTERPRETATION OF THE FACTORS

In Table 1 and Table 2, respectively, are given (*a*) full statements and (*b*) factor weights for a selected list of items. The seven most representative questions for each factor are given. One supplementary question is given for factor C and also one for E. In Table 2 the rank orders of the representative items for the factors are in parentheses.

The naming, description, and interpretation of the factors are matters of inference. However, the factor weights of the items hold inferences within certain limits. Those items with the highest weights give the best clues to the nature of the factor.

The plus and minus signs of the weights make possible a reference to the three answers for each question. For the calculation the blanks were numbered 1, 2, 3 from left to right or from top to bottom. That a group of questions have the same sign in a given factor shows that there was a tendency among the subjects to answer the several items in similar positions on the 1, 2, 3 scale.

Some simple hypotheses are made as to why certain items are found associated as representative items for particular factors. In those cases in which an item is representative of more than one factor, it is interpreted differently in the different contexts.

*Attitude Variable A.* The factor weights show the following attitudes to be associated. (The number in parentheses is the number of the item in the tables.)

1. (14) In a spectator situation interest much affected by whether right triumphs. (highest weight)
2. (24) The problem of "the duty of the individual to society" being vital.
3. (9) Much thought about the effect of one's actions on others.
4. (5) Evaluation of a person of the opposite sex based quite largely on probable satisfactoriness as a mate.
- 5 & 6. In a spectator situation interest much affected by:
  - (15) Whether strong emotions are displayed.
  - (13) Whether the situations portrayed are realistic and sordid.
7. (16) Having a standard of goodness by which plays are judged.

Similar lists of representative items are given for the other attitude variables. It is possible to take the statements in any list and replace them with directly opposed statements. The opposites of the listed attitudes are associated in exactly the same manner as the listed attitudes.

In the attitudes listed for A there is an ethical element. The most general characteristic is the acceptance of standards of "right" to which the relations of man to man should conform. The standards are essentially social. That they affect interest in a spectator situation (14) and stimulate thought of the effect of one's actions (9) shows the standards are more than mere verbal affirmations. The opposition between the actual and the ideal (13) is one aspect of the good-bad dichotomy. The involvement of (15) in the group may be connected with (a) the frequency of emotional outbursts in situations in which the proprieties are outraged or (b) the limits

placed by convention on emotional expression. The heterosexual attitude (5) listed suggests a certain seriousness and an adherence to conventional sex standards.

*Attitude Variable B.* The following attitudes are associated:

1. (30) Liking for being waited on. (highest weight)
2. (10) Much enjoyment in the use of language.
3. (29) Preference for working with people as compared with things.
4. (8) Much fluctuation in general attitude.
5. (25) Worrying frequently.
6. (3) Enjoyment in doing or saying shocking things.
7. (2) Change in the past two years in type of associate preferred.
8. (19) Enjoyment in riding at high speeds.
9. (16) Having a standard of goodness by which plays are judged.

There seem to be two aspects to this variable: (*a*) variation in enjoyment of momentary pleasures and (*b*) variation in fluctuation of attitude. In being waited on, one is the center of attention and for a moment dominates. Similarly there is a momentary thrill in doing shocking things and riding at dangerous speeds. In dealing with people, particularly through language as an instrument of social control, many intense pleasures can be obtained. But this situation and the others listed as pleasurable are not of the sort which provides a basis for lasting satisfaction. Fluctuation, ups and downs of attitude, are found associated with the over-emphasis on momentary pleasures.

It is interesting to note that the attitudes listed above are strikingly akin to those which have been found to characterize the young as compared to the old. Strong (6) has found that (*a*) older men are less interested in items involving skill and daring and (*b*) are more averse to change or interference with established habits. (*c*) Linguistic activities of an oral or written nature are less interesting to the older men. (*d*) Older men are less interested in the people associated with them.

*Attitude Variable C.* The following attitudes are associated:

1. (11) In a spectator situation interest much affected by the extent to which a conflict of personalities occurs. (highest weight)



2. (23) The problem of "whether the modern industrial and machine age limits and dulls most people's appreciation of beauty" being vital.
3. (30) A dislike of being waited on.
4. (27) Criticalness, or alertness in regard to propaganda.
5. (22) The problem of whether the use of force in settling disputes is justified being vital.
6. (18) An enjoyment of moderately strong cold winds.
7. (20) The problem of waste versus efficiency in the economic and social system being vital.

The C variable is one of differential reaction to situations of conflict and controversy. Some aspects are variations (*a*) from indifference to enjoyment in watching scenes of conflict (cf. 11); (*b*) from indifference to enjoyment in putting oneself in opposition to presented ideas (cf. the vital problems), to persons (cf. 30), or to the physical environment (cf. 18); and (*c*) in concern about the welfare of individuals who are victims of the pressures and conflicts of their environment (cf. 20, 23, and 30). Dislike of dullness of appreciation and dislikes of servility may vary with the recognition that these traits are inevitable results of forces and circumstances largely beyond the control of the individuals affected.

*Attitude Variable D.* The following attitudes are associated:

1. (4) Much enjoyment in working with materials and in making things. (highest weight)
2. (6) Much interest in politics.
- 3 & 4. In a spectator situation indifference to:
  - (11) Conflicts of personalities.
  - (12) Violations of conventional codes of behavior.
5. (1) Indifference to whether acquaintances like children.
6. (2) Stability in type of associate preferred.
7. (21) The problem of free will being vital.

This factor is one of variation in interest in the manipulation and control of things (or persons). (Note the low weight in 29.) It may be thought of as a variation in desire to be an effective agent (cf. 21) or in "will to power."

The pleasure in manipulation is plausibly related to the individual's control of the sequence of action. Interest in politics is probably associated with hero worship or with a wish to play a political rôle.

The indifferences to items (11) and (12) and to a kindly characteristic in associates (1) suggest that a concentration on one's own plans and purposes is accompanied by a poor development (*a*) of "bystander" interests and (*b*) of sympathetic appreciation of the personalities of others. Also associated is a disinclination to seek a wide variety of associates (2).

It is interesting to note that the attitudes which are listed show a considerable similarity to those which Spranger (4) assigns to the "political" man.

*Attitude Variable E.* The following attitudes are associated:

1. (26) Thinking rarely about the meaning of life. (highest weight)
2. (17) Little enjoyment of spicy and highly seasoned foods.
3. (12) In a spectator situation, interest much affected by whether the conventional codes of behavior are violated.
4. (29) Preference for working with people as compared with things.
5. (4) Little enjoyment in working with materials.
6. (6) Considerable interest in politics.
7. (28) Increase in day dreaming in the past five years.
8. (7) Much difference from intimate friends in interests, likes, etc.

Important aspects of this variable are variations in social participation (29) and in understanding of the techniques of social intercourse (12). Some of the attitudes listed indicate a facility in casual social contacts with a variety of people (cf. 7). Infrequency of reflection is one of the attitudes listed. With this is associated increased day dreaming. Plausibly, the less reflective persons in college are less able to concentrate on course work.

The association of liking for spicy foods with reflectiveness is intriguing. Is a liking for irritants a compensatory development among persons who get relatively little satisfaction from casual social relations?

*Attitude Variable F.* The following attitudes are associated:

1. (27) Criticalness, or alertness in regard to propaganda. (highest weight)
2. (28) Decrease in day dreaming in the past five years.
3. (31) Having a small "social gallery."

4. (21) The problem of free will being vital.
5. (26) Frequent thought about the meaning of life.
6. (9) Much thought of the effect of one's actions on others.
7. (11) In a spectator situation indifference to conflicts of personalities.

A common thread in the attitudes listed is a relatively sophisticated and theoretical criticism. Criticalness of ideas and an interest in the "truth" are involved in (21, 26, and 27). The weight in (11) shows that the criticalness is not associated with a liking for conflict. Self-criticism is indicated in (9) and is suggested in (28). The limitation of the number of persons whose approval is sought (31) is conceivably related to the tendency of the overly critical to lose present and potential friends.

*Summary.* A condensed statement of the results of the analysis is that the following attitude variables are independent: Variations in the degree of:

- A. Acceptance of conventional ethical principles.
- B. Enjoyment of momentary pleasures.
- C. Interest in conflicts and controversies.
- D. Desire to be an effective agent.
- E. Participation in casual social relations.
- F. Criticalness and an interest in the "truth."

*Relation of the Factors to Other Organizations.* Having found certain attitude organizations, one wonders if these may be correlated with, and referable to, any other organizations. There is a possibility of referring any attitude variable (*a*) to certain innate types of organization, i.e., instincts, or (*b*) to cultural complexes, i.e., organizations of stimuli within the social environment, or (*c*) to both. With the factors found, a reference to (*b*) yields the most plausible hypothesis. A working hypothesis is that an individual's strength in an attitude variable is a measure of his responsiveness to some particular cultural complex.

Conceivably attitude variable A might be related to the organized teaching of ethical principles; B to the commercialized organizations for furnishing amusements and catering to whims; C to the constellation of discords and conflicts which have been accentuated in the present depression; D to the high valuation which for several centuries has been put on "volitional expression" in the Western

world (as opposed to the Oriental); E to the casual social element in such organizations as clubs, churches, lodges, etc.; and F to the organized inculcation by educational institutions of critical attitudes and interest in truth.

#### F. SUGGESTIONS CONCERNING FURTHER INVESTIGATIONS

An interesting project would be that of testing the hypothesis of relation between (*a*) attitude variables and (*b*) cultural complexes. This could be done by making parallel analyses of the social environment of a group and of the attitudes of its members.

Probably of more importance than the search for fields to be analyzed is the improvement of multiple-factor methods and the adaptation of them to particular types of problems. In dealing with attitudes two things should be specially noted:

1. Given a comprehensive sampling of attitudes, there is little likelihood that two or three factors will exhaust the analysis.

2. Since the measurements made of attitudes are rough, the weights of the items in the latter factors may be seriously off as a result of the cumulation of errors in the successive steps of the analysis. Study is needed as to what is the best measure of covariance: contingency coefficients, tetrachoric coefficients, indices of significant cohesion (Beyle, 1), or some yet undeveloped measure. In the analysis of the table of coefficients, one change would increase the independence of the successive steps. One could select groups of interrelated items to be factored in such a manner that the loadings of the group in all the preceding factors were low.

The approach to the study of personality by means of factor-isolation techniques is a valuable approach. One may predict that it will be used increasingly as (*a*) its possibilities are recognized, and (*b*) the techniques are improved.

One caution should be noted. The variables isolated in a factor analysis of personality traits are very valuable categories to use in surveying personality. But the factors obtained are not necessarily functional units, although they must of necessity bear some definite relation to functional psychological units. By the repeated study of a particular factor it can be delineated, and hypotheses concerning the psychological functions involved can be tested. This has been done with the general intellectual factor, *g*. Statistical analyses should serve as an aid to and not as a substitute for the development of psychological theory.

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## L'ANALYSE PAR FACTEURS MULTIPLES DES ATTITUDES GÉNÉRALISÉES

## (Résumé)

Pour éviter les études qui empiètent l'une sur l'autre et pour permettre une vue systématique de la personnalité il est nécessaire de déterminer les facteurs qui sont fondamentaux. Les méthodes statistiques employant les facteurs multiples sont les meilleures puisque les valeurs des points en facteurs sont déterminées par une mesure impersonnelle.

On a employé la méthode de Thurstone pour trouver les facteurs communs impliqués dans les réponses à 46 questions sur des attitudes personnelles assez générales. Cette investigation semble le premier essai d'appliquer les techniques de facteurs directement à un groupe hétérogène d'attitudes. Chaque attitude a été mesurée sur une échelle triple. On a trouvé les coefficients de contingence. L'analyse de la table des coefficients a montré que les facteurs suivants sont indépendants. Variations dans le degré:

- a. de l'acceptation des principes ordinaires moraux
- b. de la jouissance des plaisirs passagers
- c. de l'intérêt aux conflits et aux controverses
- d. du désir d'être un agent effectif
- e. de la participation aux relations sociales casuelles
- f. de l'esprit critique et de l'intérêt à la vérité

La méthode n'a pas été suffisamment constante pour s'étendre à plus de six facteurs. Le manque de précision de mesure possible avec les attitudes est une difficulté principale. On suggère des modifications de la méthode.

WHISLER



VIELFACHE FAKTORENANALYSE VON VERALLGEMEINERTEN  
ATTITÜDEN

(Referat)

Um übergreifende Untersuchungen zu vermeiden, und einen systematischen Ueberblick der Persönlichkeit zu ermöglichen, ist es notwendig zu erforschen, welche Faktoren wesentlich sind. Statistische vielfache Faktorenmethoden sind die besten, da die Grössen der Einzelheiten in den Faktoren durch unpersönliches Messen bestimmt werden.

Thurstones Methode wurde verwendet, um die allgemeinen Faktoren zu finden, welche in den Antworten auf 46 Fragen nach ziemlich allgemeinen persönlichen Attitüden enthalten sind. Die Untersuchung scheint der erste Versuch zu sein, Faktorenmethoden direkt auf eine verschiedenartig Gruppe von Attitüden zu verwenden. Jede Attitüde wurden auf einer dreifachen Skala gemessen. Zufälligkeitskoeffizienten wurden errechnet. Die Analyse der Tabelle von Koeffizienten zeigte, dass die folgenden Faktoren unabhängig sind. Variationen in Grade von:

- a. Annahme von konventionellen ethischen Grundsätzen
- b. Genuss von augenblicklichen Freuden
- c. Interesse an Konflikten und Streiten
- d. Der Wunsch, ein wirksamer Agent zu sein
- e. Teilnahme an gelegentlichen, gesellschaftlichen Beziehungen
- f. Kritische Sorgfalt und Interesse an der "Wahrheit"

Die Methode war nicht hinreichend gültig, um weiter als über sechs Faktoren hinaus geführt zu werden. Die Grobheit des Messens der Attitüden ist eine Hauptschwierigkeit. Veränderungen der Methode werden vorgeschlagen.

WHISLER

# GENERALIZED ATTITUDE SCALES\*<sup>1</sup>

*From the Division of Educational Reference of Purdue University*

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H. H. REMMERS AND ELLA BELLE SILANCE

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## I. THEORETICAL

The scaling technique developed by Thurstone is theoretically and logically the best procedure yet devised for obtaining valid and reliable measures of psychological variables that are highly important, especially in the general field of social-psychological phenomena. So-called rating scales of personal or other qualities—graphic, numerical, man-to-man, paired-comparison, etc.—are usually not *scales* at all in the sense of yielding known equal units of measurement of a psychological continuum. The evidence and logic supporting this statement will not be presented here, since they may be found in the references cited.

Thurstone and his students, as well as others, have now developed a considerable number of attitude scales. Many of these have been used to a considerable extent in carrying out psychological researches, most of which would have been impossible without these measuring instruments.

Thurstone's method, however, has one practical limitation of considerable importance—the scaling is a very laborious procedure. The collection of the affective statements, having them sorted into equally spaced categories, tabulating the results of the sortings, and finally determining the scale values—all of this constitutes a task representing many hours of work for a single scale. A hundred hours is probably too conservative. As a consequence, only attitudes of considerable stability are usually worth scaling. Attitudes, if transient, though they may be very important, are not “worth the candle,” or time may not permit the scaling procedure before the occasion for measuring the attitude in question has passed.

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<sup>1</sup>Division of work in this paper is as follows: Remmers wrote all of Part I, “Theoretical.” Under his direction Silance constructed the scale presented in Part II as a master's thesis.

Another consideration of a somewhat similar import is that a practically unlimited number of attitudes—in Thurstone's sense—might be defined and scaled. Any situation, idea, institution, proposed social action—in short, any phenomenon to which social groups may react—contains the possibilities of from one to many scales of attitude toward the phenomenon in question. For the social scientist, the statesman, administrator, or executive the number of attitudes about which more exact knowledge might be highly desirable and useful will, it is to be feared, forever outrun the possibilities of scaling and measuring. And this not because of the theoretical impossibility of encompassing the task, but because of the practical obstacles constituted by the labor involved.

Consider a few examples. It will, I believe, be readily admitted that a knowledge of the attitudes toward defined vocations would be desirable and useful in many ways. There are in the United States Census Report something over 20,000 job classifications. Even if these could be grouped into closely similar categories, the task of scaling would still be stupendous for a relatively complete survey. Or consider a proposed group action concerning which one wanted a more accurate measure than that typically obtained on the two-point scale of "aye" and "no"—the crudest and most primitive measuring scale possible. It is obvious that the exigencies of the occasion would not usually permit of the time for the scaling, and, since the number of such occasions is very large, the aggregate of the labor involved would be staggering over even a relatively short period. If Plato's ideal of having philosophers kings (in modern times perhaps scientists and technologists) were to come to pass, a more precise knowledge of many attitudes would no doubt be demanded, but the conclusion might easily be drawn that the end was not worth the cost, at least for many attitudes that might be defined. Again, suppose that a school administrator desired a psychologically sound measurement of student attitudes toward the courses offered in the curriculum. With a thousand or more different courses being offered in some of our larger universities the task of scaling would be prohibitive, and the administrator, after consulting his department of psychology and the budget, would arrive at his decisions as before—on the basis of a more or less shrewd guess often dignified as "administrative insight."

In view of the preceding considerations it is evident that it would

be highly desirable to make possible the measurement of more attitudes without sacrificing the theoretical rigor and precision underlying the method developed by Thurstone. It is the purpose of this paper to describe a possible modification of Thurstone's techniques which may retain the primary theoretical advantages of his scaling techniques and at the same time enable the measurement of many more attitudes with no increase in labor.

The method, so far as scaling is concerned, is based on the psychophysical theorem that equally-often-observed differences are equal, the same theorem as that upon which the attitude scales constructed by Thurstone and his students are based. Affective statements or stereotypes which are debatable and will depend for their endorsement or lack of endorsement by different individuals upon the attitude held by the individuals in question will be searched for. The assumption is that endorsement of such statements may be taken as an index of the individual's attitude as measured on a psychological continuum defined by the scaling of the affective statements.

The essential difference of the method from that developed by Thurstone lies in the assumption that attitude toward any one of a large *group* or *class* of objects can validly be measured on a single scale. "Object" is here used in the logical sense as opposed to "subject." An object in this sense is any affective stimulus to which an individual may react. It may range, therefore, from a very concrete phenomenon to the most abstract idea possible.

Based on this assumption, then, the search for affective statements will concern itself with such statements as will validly and unambiguously apply to any member of such a large class of objects.

The case may be illustrated with some scales already developed by Thurstone and by students under his direction—scales for measuring attitudes toward members of a race or nationality other than that of the subject being measured, as Negroes, Chinese, Germans, Russians, Swedes, Italians, etc. It should be perfectly possible to find or invent a sufficiently large and varied number of affective statements which when scaled would accurately measure the attitude of individuals or groups toward any one or all of the racial or national categories in question. The selection of the affective statements and their scaling would be not for a continuum representing the attitude toward a single one, but for a continuum representing attitude toward any and all national or racial groups.

When the affective statements are scaled in accordance with the psychophysical theorem adapted by Thurstone, it will be necessary only to define a particular national or racial group for measurement purposes by having the subjects write in at the top of the completed scale the name of the group toward which attitude is to be measured. This procedure will result in what might be called a series of master scales for classes of objects, situations, institutions, ideas, etc.

In a letter concerning the proposed modification of technique of attitude scale construction, Professor Thurstone makes this comment:

There are some difficulties with that sort of scale but it has possibilities for some types of stimuli. If the method is used for measuring attitudes toward nationalities, then the scale might be inadequate if it does not represent current stereotypes for some one nationality. If it should be a rather frequent comment that the Japanese are sly and deceptive, that particular characteristic might not be included in a list of opinions which is prepared to measure attitudes toward nationalities. The acceptance of stereotypes might be excellent indicators of affect even when the stereotype is not one that is generally used to represent negative affect.

The problem of validity of the generalized scale then becomes an experimental one. In the first place, each opinion selected for experimental try-out can be evaluated in terms of the criterion of ambiguity, defined quantitatively by a measure of variability of the opinion as allocated on the scale by the experimental subjects who sort the opinions. The various statements can further be evaluated on the criterion of internal consistency as defined by Thurstone. Finally, the validity of the generalized scale can be evaluated in terms of the correlation of the attitude toward a given kind of stimuli when measured in terms of both types of scales. That is, one may take, for example, a scale of attitude toward a single nationality as developed by Thurstone and his students, and, having constructed a generalized scale as here proposed, measure the attitude of a given population with both scales. The correlation between the two series will then constitute a measure of the validity of the generalized scale, using scores on the specific scale as the criterion measure.



It is possible that experimentation will reveal that, in order to obtain an adequate measure of affect on such a generalized scale, it may be necessary to have a relatively longer list of propositions with which the subjects measured may agree or disagree, in order that any given degree of affect of any individual may find its proper counterpart in the opinions or propositions of the scale. Adequate experimentation will reveal whether or not this is true. It is relatively easy, however, as will be shown in Part II of this paper, to find affective verbalizations concerning any high-school subject which are functionally the same for different individuals as shown by their lack of variability in the allocation of the statements to a particular point on the scale. And it is the finding of these verbally functional equivalences that would seem to constitute the major problem of the generalized scale.

A hypothetical illustration will make clear the essential difference in the two types of scales. Suppose that we wish to obtain a measurement of the attitude toward vocations<sup>2</sup> as they exist today. The Thurstone technique would require that affective statements or stereotypes be found and scaled for each vocation—some twenty-odd thousand scales. For the generalized type of scale proposed in this paper one will have such statements as the following:

1. I would rather do this work than eat.
2. This work is monotonous and degrading to one's mental life in the highest degree.

Without knowing precisely where on the scale of affectivity these statements would be allocated experimentally, it is fairly certain that statement 1 would stand fairly high toward the positive end, while statement 2 would equally certainly be placed well toward the negative end of the scale. It also seems evident that such statements as expressions of attitudes are meaningfully related to any vocation whatsoever, and that any particular vocation can be defined for purposes of measuring attitude toward it by the experimenter at the time of measuring by simply naming the vocation or by stating the *Aufgabe* in more detail as his purposes may dictate.

What has been said by way of illustration concerning vocations will apply equally well to political parties, religious sects, civic

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<sup>2</sup>Such a scale is being constructed under the writer's direction.

groups, candidates for election,<sup>3</sup> social groups, scientific groups, games played, books read, political issues, racial or national groups, and so on for an indefinite list. Even attitudes toward individuals may conceivably be so scaled and measured.

The selection of significant and important groups or classes of objects to be selected for attitude measurement will obviously depend upon the investigator's interest and upon his insight and ingenuity. If psychology is to serve human ends, the development of adequate measuring instruments of the sort here discussed is one of its important tasks. The effect of educational procedures in producing one or another kind of attitudes stands in pressing need of scientific evaluation. The effect of various types of talking pictures relative to a large number of attitudes determining important social consequences is a problem which should receive considerably more scientific attention than has yet been given to the matter. The attitudes produced by reading a certain newspaper rather than another, the effect of political campaigns, the attitudes resulting from a given type of religious, economic, or nationalistic indoctrination—these and a host of similar problems will be enormously facilitated in their solution by the application of this kind of measuring instrument.

## II. AN EXPERIMENTAL GENERALIZED MASTER SCALE: A SCALE TO MEASURE ATTITUDE TOWARD HIGH-SCHOOL SUBJECT X

A specific application of the foregoing theory has been made to the construction of a scale to measure student attitude toward any high-school subject.<sup>4</sup> One hundred fifty affective statements were collected from the following sources: (1) Approximately 100 col-

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<sup>3</sup>Since this paper was written my attention has been called to the fact that Professor Herman C. Beyle of Syracuse University has developed a rating scale which is a generalized rating much in the sense of the argument of the present paper. It is designed for the "measurement of attitude toward candidates for elective governmental office." From correspondence with Professor Beyle it appears that he is working on two or three other scales of a similar sort, all in the general field of political science. If work with this kind of scales be stimulated in several centers, we should soon know much more than we now do about the possibilities and limitations of this type of measuring instrument.

<sup>4</sup>This work was done by Miss Ella B. Silance as a master's thesis under the senior author's direction.

lege freshmen themes written on school subjects liked or disliked;<sup>5</sup> (2) textbooks on methods of teaching and other educational literature; and (3) statements written by Miss Silance. These statements were mimeographed on slips of paper and sorted by 189 college and high-school students and scaled according to the equally-often-noticed-difference principle. Of the 189 sortings 39 were rejected on the basis of two criteria. (1) If a student had more than one-fifth of all statements in one of the eleven scale categories, this was taken as evidence of careless sorting. (2) A few students misunderstood the instructions, in that they assumed that they must think of some particular subject which they had studied and must sort the statements as a measure of their own attitude toward this hypothetical subject. Where this was known, either from statements made by the experimental subject or from internal evidence of the sortings, the sortings in question were rejected. Even if all of the rejected sortings had been retained, however, the scale values of the opinions, or their variability, would have been affected to a negligible degree.

On the basis of the 150 sortings, two equivalent forms, A and B, of the attitude scale were constructed by selecting 45 pairs of opinions of which the experimental scale values (medians) and measures of variability (interquartile ranges) were as nearly as possible identical. These values are given in Table 1. The opinions are arranged in descending order of magnitude of the interquartile range values.

The two forms of the scale arranged as numbered in Table 1 will be submitted to experimental determination of reliability ( $r_{AB}$ ). Whether all 45 statements need to be retained or not to achieve a desired reliability can be conveniently determined by scoring the two forms for fractional parts of the scale. That is, the reliability of the first 10, 15, 20, 25, —45 can be determined from one application of the two scales by successive scorings of these fractional parts. It is hoped to do this in the very near future. There is every reason to believe from the behavior of other scales that satisfactory correlations will be obtained.

With this instrument it will obviously be a simple matter to

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<sup>5</sup>We are indebted to the English Department of Purdue University, especially to Dr. H. L. Creek, Head, and Professor J. H. McKee for cooperation in securing these themes.

TABLE 1

EXPERIMENTAL SCALE VALUES AND INTERQUARTILE RANGE VALUES FOR FORMS  
A AND B OF THE SCALE FOR MEASURING ATTITUDE TOWARD  
ANY HIGH-SCHOOL SUBJECT

Statement number	Scale value		Interquartile range	
	Form A	Form B	Form A	Form B
1	0.6	0.6	0.6	0.6
2	0.7	0.7	0.8	0.9
3	0.8	0.8	1.0	1.0
4	1.0	1.0	1.1	1.3
5	1.3	1.3	1.8	1.0
6	1.5	1.5	1.7	2.0
7	1.6	1.6	1.9	1.9
8	2.1	2.1	1.6	2.3
9	2.2	2.2	2.2	1.9
10	2.4	2.4	2.3	2.2
11	2.5	2.5	2.3	2.1
12	2.6	2.6	2.3	2.6
13	2.8	2.8	2.2	2.2
14	2.9	2.9	2.2	2.2
15	3.1	3.1	2.4	2.0
16	3.3	3.3	1.8	1.7
17	3.4	3.4	2.3	2.3
18	3.5	3.5	1.9	1.8
19	3.6	3.6	2.7	2.3
20	4.7	4.7	2.9	1.6
21	5.5	5.5	0.5	0.5
22	5.8	5.9	1.9	2.1
23	6.1	6.0	1.3	2.2
24	6.5	6.5	1.9	1.0
25	6.8	6.7	1.7	1.7
26	7.3	7.3	2.2	2.0
27	7.6	7.6	1.9	2.1
28	7.7	7.7	1.8	1.8
29	7.9	7.9	2.7	0.9
30	8.1	8.1	2.6	2.0
31	8.3	8.3	1.9	1.8
32	8.4	8.4	2.2	2.2
33	8.5	8.5	2.0	2.0
34	8.7	8.7	2.4	1.9
35	8.8	8.8	1.6	1.6
36	8.9	8.9	1.5	1.6
37	9.0	9.0	1.8	1.8
38	9.1	9.1	1.6	1.6
39	9.2	9.2	2.0	2.1
40	9.4	9.4	1.7	1.8
41	9.6	9.6	1.3	2.0
42	9.7	9.7	1.2	1.6
43	9.8	9.8	1.6	2.0
44	10.2	10.3	1.1	1.1
45	10.3	10.3	1.4	1.4

determine the affective pattern of students for any given curricular offering of high-school subjects, a matter of practical as well as theoretical importance.

It is probable also that, although the scale was constructed to measure attitude toward high-school subjects, it will lend itself as it stands to the measurement of attitude toward college subjects and even elementary-school subjects. Experimental verification of this will shortly be undertaken.

The two forms of the scale are appended.

It is obvious from comparison with Table 1 that the statements are arranged in ascending order of magnitude of scale values, the unfavorable end of the scale being represented by the lower scale values, and the favorable end by the higher scale values. The scale as shown here is arranged for experimental try-out with college students for four college subjects, the names of the subjects to be written in at the time of measuring the attitude. Attitude toward any number of subjects can of course be measured. Four was the number chosen as being conveniently possible of measurement within a single class period.

#### A SCALE FOR MEASURING ATTITUDE TOWARD SCHOOL SUBJECTS

##### FORM A

##### *Directions:*

Following is a list of statements about school subjects. Place a plus sign (+) before each statement with which you agree, and a minus sign (—) before each statement with which you disagree with reference to each of the subjects listed at the left of the statements. Your score will in no way affect your grade in any course.

Name .....  
(You need not give your name if you prefer not to have your name known.)

Sex: male, female (underline one.)

College subject you like best .....

College subject you like least .....

Age: .....

What occupation would you like best to follow? .....

##### Subject

						1. I hate this subject.
						2. This subject is the most undesirable subject taught.
						3. I detest this subject.



## Subject

					4. I look forward to this subject with horror.
					5. This subject is disliked by all students.
					6. It is a punishment for anybody to take this subject.
					7. This subject is a waste of time.
					8. This subject is based on "fogy" ideas.
					9. I would not advise any one to take this subject.
					10. I have seen no value in this subject.
					11. I have no desire for this subject.
					12. This subject reminds me of Shakespeare's play—"Much Ado About Nothing."
					13. This subject is very dry.
					14. This subject does not teach you to think.
					15. I am not interested in this subject.
					16. The minds of students are not kept active in this subject.
					17. Mediocre students never take this subject, so it should be eliminated from schools.
					18. I could do very well without this subject.
					19. My parents never had this subject, so I see no merit in it.
					20. This subject will benefit only the brighter students.
					21. I haven't any definite like or dislike for this subject.
					22. I am careless in my attitude toward this subject, but I would not like to see this attitude become general.
					23. I don't believe this subject will do anybody any harm.
					24. This subject is a good pastime.
					25. This subject is not a bore.
					26. This subject saves time.
					27. This subject is not receiving its due in public high schools.
					28. I am willing to spend my time studying this subject.
					29. This subject is O.K.
					30. All lessons and all methods used in this subject are clear and definite.
					31. This subject is a cultural subject.

## Subject

					32. All of our great men studied this subject.
					33. This subject is a good subject.
					34. This subject is a universal subject.
					35. This subject teaches me to be accurate.
					36. Any student who takes this subject is bound to be benefited.
					37. This subject is very practical.
					38. This subject develops good reasoning ability.
					39. This subject is profitable to everybody who takes it.
					40. I really enjoy this subject.
					41. This subject has an irresistible attraction for me.
					42. This subject is of great value.
					43. I love to study this subject.
					44. I would rather study this subject than eat.
					45. No matter what happens, this subject always comes first.

A SCALE FOR MEASURING ATTITUDE TOWARD  
SCHOOL SUBJECTS

## FORM B

*Directions:*

Following is a list of statements about school subjects. Place a plus sign (+) before each statement with which you agree, and a minus sign (—) before each statement with which you disagree with reference to each of the subjects listed at the left of the statements. Your score will in no way affect your grade in any course.

Name .....

(You need not give your name if you prefer not to have your name known.)

Sex: male, female (underline one.)

College subject you like best .....

College subject you like least .....

Age: .....

What occupation would you like best to follow? .....

## Subject

					1. This is the worst subject taught in school.
					2. Words can't express my antagonism toward this subject.

Subject

					3. No sane person would take this subject.
					4. This subject is all bunk.
					5. This subject is more like a plague than a study.
					6. Nobody likes this subject.
					7. This subject has no place in the modern world.
					8. This subject can't benefit me.
					9. All of the material in this subject is very uninteresting.
					10. The average student gets nothing worth having out of this subject.
					11. This subject does not hold my interest at all.
					12. This subject seems to be a necessary evil.
					13. This subject is dull.
					14. This subject interferes with developing.
					15. This subject has numerous limitations and defects.
					16. This subject does not motivate the pupil to do better work.
					17. No definite results are evident in this subject.
					18. To me this subject is more or less boring.
					19. No student should be concerned with the way this subject is taught.
					20. This subject is all right, but I would not take any more of it.
					21. My likes and dislikes for this subject balance one another.
					22. This subject does not worry me in the least.
					23. This subject might be worth while if it were taught right.
					24. This subject has its drawbacks, but I like it.
					25. I think this subject is amusing.
					26. This subject is not based on untried theories.
					27. This subject aims mainly at power of execution or application.
					28. Every year more students are taking this subject.
					29. This subject has its merits and fills its purpose quite well.

Subject				
				30. All methods used in this subject have been thoroughly tested in the classroom by experienced teachers.
				31. This subject serves the needs of a large number of boys and girls.
				32. This subject teaches methodical reasoning.
				33. This subject is interesting.
				34. There are more chances for development of high ideals in this subject.
				35. This subject makes me efficient in school work.
				36. This subject will help pupils socially as well as intellectually.
				37. This subject gives pupils the ability to interpret situations they will meet in life.
				38. The merits of this subject far outweigh the defects.
				39. This subject fascinates me.
				40. This is one subject that all young Americans should know.
				41. I believe this subject is the basic one for all high school courses.
				42. This subject is one of the most useful subjects I know.
				43. If I had my way, I would compel everybody to study this subject.
				44. The very existence of humanity depends upon this subject.
				45. I am "crazy" about this subject.

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## L'ÉCHELLE GÉNÉRALISÉE DES ATTITUDES

### (Résumé)

La technique de Thurstone pour classer les attitudes sur une échelle est théoriquement la plus exacte qu'on ait encore inventée. Elle souffre cependant d'une limitation sévère—celle de la grande quantité de travail nécessaire pour faire l'échelle. On peut définir et mettre sur l'échelle pratiquement un nombre illimité d'attitudes—dans le sens de Thurstone. N'importe quelle situation, idée, institution, action sociale proposée—n'importe quel phénomène auquel des groupes sociaux peuvent réagir contient les possibilités d'une échelle ou de plusieurs échelles de l'attitude.

Il serait très désirable de rendre pratiquement possible la mesure de beaucoup plus d'attitudes sans sacrifier la rigueur et la précision théorique au fond de la méthode développée par Thurstone. On propose une méthode qui n'augmentera pas le travail et qui ne sacrifiera pas la rigueur théorique mais qui rendra possible la mesure des attitudes à l'égard de grands groupes d'objets (on emploie ici "objet" dans le sens logique comme opposé à "sujet"). La recherche des déclarations affectives ou stéréotypes se dirigerait aux déclarations qui s'appliqueraient toutes valablement à un continuum psychologique représentant l'attitude à l'égard de chaque membre et de tous les membres d'un grand groupe d'objets, tels que nations, races, sectes, institutions, vocations, partis politiques, etc. On peut ainsi produire une série "d'échelles de maître." On inclut les résultats d'une expérience qui teste cette dernière position théorique à l'égard de l'attitude pour n'importe quelle matière scolaire.

REMMERS ET SILANCE



## VERALLGEMEINERTE ATTITÜDENSкала

(Referat)

Die Thurstone-Methode zur Verwertung der Attitüden ist theoretisch die gründlichste, die bis jetzt verwendet worden ist. Trotzdem ist sie aber sehr begrenzt, weil sie so viel Arbeit zur Verwertung erfordert. Praktisch kann eine unbegrenzte Anzahl von Attitüden im Sinne Thurstones aufgestellt und verwertet werden. Jede Situation, Idee, jedes Institut, jede vorgeschlagene soziale Tätigkeit, irgendeine Erscheinung, auf die soziale Gruppen reagieren, weist die Möglichkeiten einer oder mehrerer Skalen von Attitüden auf.

Es wäre sehr wünschenswert, das Messen von noch vielen Attitüden praktisch möglich zu machen, ohne dabei die theoretische Strenge und Genauigkeit der von Thurstone aufgestellten Methode zu opfern. Eine Methode wird vorgeschlagen, die die Arbeit nicht erhöhen wird, und die die theoretische Strenge nicht opfern wird, sondern das Messen der Attitüden auf grosse Gruppen von Objekten ("Objekt" wird hier im logischen Sinne gebraucht und dem "Subjekt" gegenübergestellt) ermöglichen wird. Man muss nach affektiven Angaben oder Stereotypen suchen, die auf alle Mitglieder einer grossen Gruppe von Objekten gültig angewendet werden können, wie Nationen, Rassen, Sekten, Institute, Berufe, politische Parteien, usw. Eine Reihenfolge von "Meisterskalen" kann auf diese Weise aufgestellt werden. Die Ergebnisse von einem Experiment, welche die obenbesprochene theoretische Stellung mit bezug auf die Einstellung auf irgendein Schulmaterial nachgeprüft werden sollte, sind mitgegeben.

REMMERS UND SILANCE

## PERSONALITY TENDENCIES AND SUSTAINED ATTENTION IN PRESCHOOL CHILDREN\*

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HELEN S. SHACTER

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Although investigations of differences in the attentive activity of individuals have been numerous,<sup>1</sup> comparatively few studies have been made concerning such differences in very young children. Such conclusions as have been presented have only too often been unsupported theories, based upon varyingly controlled observations in nursery and kindergarten groups and questionable as satisfactory evidence upon which to determine adequate social and pedagogical procedure either in school or in home situations.

The several observational studies of groups of young children most frequently explain the differences noted in the sustaining of attention as being due to differences in intelligence, as do Cushing (14) and Van Alstyne (37); or to the age of the subjects, as do Bott (6), Davidson (17), Goodenough (20), Van Alstyne (37); or to sex differences, Bridges (8, 10), Cushing (14), Goodenough (20), Herring and Koch (24), Van Alstyne (37). One investigator, Goodenough (20), concluded that only children exhibit shorter periods of sustained attention than do children having one or more siblings.

These observations not only ascribe the attention differences to a variety of different causes, but offer results which present conflicting records of the attention-spans of the subjects observed. Attention-spans are indicated in some instances by descriptive categories, in some by quantitative measures; the former classification is based wholly upon subjective observation, the latter presents scores

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<sup>1</sup>Geissler (19) has reviewed the earlier investigations, dating from the work of Wundt and Obersteiner in 1874 to that concluded in 1908. Dallenbach (15, 16) has described later experimentation, through 1928. The European experimental work was surveyed thoroughly by Henning (23) in 1925.

denoting the minutes spent at given activities. Bott (6) found 2.7, 4.4, and 5.3 minutes to be the time of sustained attention of two-, three-, and four-year-old children, respectively. Bridges (7) observed three- and four-year-old children and quoted 3 minutes as the average time limit for concentration; later observations by the same investigator (8, 10) extended this to 8 minutes. Cushing (14) reported average time scores ranging from 3.3 to 21.1 minutes for subjects having an age range from two to five years. Van Alstyne (37) reported 6.9, 8.9, 11.4, and 12.6 as the time records of a group of children aged two, three, four, and five years, respectively.

To complicate further the situation concerning manifestations of attention, the investigations dealing directly with some aspect of the attention process in individual young children, as opposed to observations of play activities of children in group situations, have resulted in conflicting evidence. These experimental results are contained in five published accounts.

The first to appear was by Bertrand (3) in 1925, who concluded that both age and sex are important factors regulating the sustaining of attention, but that individual children vary markedly in their attention-spans on different days. Wallon (38), in 1929, stated that motor disorders are correlated with most of the causes leading to inattention. A study using reaction-time as a measure of attention, made by Brown (11) in 1930, indicated that intelligence is little involved in regulating the performance required of the subjects, but that it is to be considered in their ultimate success in mastering a given problem. A fourth investigator, Leontiev (29), presented results in 1932 presuming his subjects incapable of sustaining attention. The writer has reported elsewhere (35) an investigation of the attentive activity of preschool children which suggested that no significant differences in sustaining attention appear at the different preschool age levels, that sex differences are apparent, and that on different days individual children show consistently brief or long sustained periods of attention.

These experimental studies disagree not only as to the causative factors involved in sustaining attention, but also as to the attention-spans manifested by preschool subjects. Bertrand (3) held that three-, four-, and five-year-old children show attention-spans of 10, 16, and 25 minutes, respectively. Wallon (38) did not concern

himself with the duration of the attention displayed by his subjects. Brown (11) divided the experimental time into alternating work and rest minutes, preceded by one minute of preliminary practice, keeping each subject at the problem set for ten minutes, and her evidence notes that "the kymograph reading can give no picture of the difficulty we had in holding these children to their task" (p. 271). Leontiev (29) organized an involved question-answer situation as his measure of attention, from which he concluded that preschool subjects exercise no control over attentive processes, offering no comment as to a quantitative measure of their attention, and qualifying these findings by a statement to the effect that the small number of subjects used—there were seven children between five and six years of age—did not permit any insistence upon the exactitude of the obtained data. The writer (35) concluded that the attention-span of preschool subjects may be expected to vary between 8 to 12 minutes, dependent upon the complexity of the activity engaged in, but that wide individual differences remain to be accounted for.

For these varying lengths of time devoted to specified activities by the preschool subjects studied, with the varying explanations suggested to account for the different attention-spans, there remains to be demonstrated experimentally consistent and valid evidence which will present some element or elements accountable for the displayed discrepancies in the periods of sustained attention reported. There has already been mentioned the study made by the writer (35) which ruled out *age differences* at the preschool level as influencing attention-span, and which suggested *sex differences* as indicating consistently a longer span for girls than for boys, with the type of materials utilized in the experimental procedure. In another report (36), the writer concluded that the relationship shown to exist between attentive activity and intelligence is too small to warrant implying *differences in intelligence* as regulating differences in attention-span.

The present paper is an attempt to explain the varying periods of sustained attention in preschool children on a wholly different basis: It is the contention of the study here reported that the underlying fundamental cause of the differing attentive behavior of the preschool subjects examined lies in *personality differences*.

The data concerning the attention of the 36 preschool children

of the present investigation were assembled in an experiment designed to measure the sustained attention of such subjects (35). With these measures of sustained attention, it was desired to ascertain the degree of relationship existent of the personality tendencies of the subjects.

Great differences in types of reactions are clearly differentiated at early age levels. To obtain personality-trait differences in the subjects of the investigation, a measure was sought which would present dependable evidence of personality characteristics, and which would be applicable for use with young children. A limited use has been made of several scales designed for such measurement; only one has been developed and standardized to such a degree that its use offers dependable results.

In 1925, Marston (30) developed a rating scale for the demarcation of characteristics of personality on the basis of a distinction between introvert and extrovert tendencies. These tendencies Marston held to be manifested by overt expressions of energy qualities. His Personality Rating Scale was designed specifically as a means to study character traits in young children, his objective being

. . . to determine to what extent young children's reactions to their environment . . . are conditioned by constant tendencies to introversion and extroversion. (30, p. 16)

The Scale includes twenty items, each of which consists of two descriptive statements of opposite characteristics. The twenty items are classified by the author of the scale as distinguishing (1) Social or Self-Attitudes, (2) Energy Qualities, and (3) Emotional Tendencies. Ten traits are described in the first category, seven are included in the second, and three occur in the third group.

That one of a pair of statements which accurately describes the child to be rated is marked with two plus signs; if the description is not definitely illustrative, but inclines toward the characteristic as observed in the child, it is marked with a single plus sign. There are, of course, instances where neither of the descriptive statements seems to apply, in which cases both are marked with a minus sign. The scoring method provides for the translation of these signs into numerical values, with scores ranging from 20, indicating extreme introversion, to 100, indicating extreme extroversion, a total score



of 60 representing a theoretical balance of the two opposing tendencies.

The terms "introversion" and "extroversion," originally suggested by Jung (28), have been somewhat varyingly interpreted by other writers on the subject of personality. For the purpose of this study, the writer interprets the extrovert as the expressive, active, impulsive individual; the introvert as the deliberative, reflective, and reserved individual. Regarding the physiological basis for introversion and extroversion, Marston states

. . . Extroversion is the skeletal expression of emotion; introversion is the dissipation of emotionally aroused energy within the organism rather than the adequate discharge of this energy through skeletal channels upon the environment. (30, p. 10)

Thus the cerebrospinal system is the underlying neural mechanism for extroversion, and the autonomic system that for introversion.

One may or may not agree with the judgment held by some writers that extroversion is a normal condition. Allport (1) says

. . . The extrovert simply lacks the symptoms of repression, conflict, over-sensitiveness, unreality, and protracted day-dreaming. He is easier to make contacts with. . . . Life for him is probably less rich in emotional and imaginal experience than for the introvert; but he is likely to be better adjusted to the actual world and the people in it. (1, p. 116)

Which mode of reaction is the most desirable, whether or not one can, or should seek to, guide the development of either in the young child, is not the province of the present investigation. Each should, in the opinion of the writer, be considered as a trait, both representing extremes of behavior, with manifested gradations connecting these extremes.

The introvert has been identified by many writers—notably Jung (28), Wells (39), Allport (1)—with the egocentric type. It is of interest to note here that Piaget (31) holds the lack of organization of attention in young children to be due to their egocentricism (p. 75).

The use of the Marston Scale in rating such tendencies as introversion and extroversion has been demonstrated to be reliable when in the hands of qualified raters—those who have what Marston terms a "thorough acquaintanceship" with the child to be rated

(30, p. 46). In the investigation here described there was a most fortunate situation in regard to the raters.

All of the subjects were enrolled in the Elementary School of Chicago Teachers College, the latter a training school specializing in the teaching of young children. Some of the teachers in the Elementary School function not only as experts in their teaching field, but qualify also as instructors in the normal college. Of the three groups in which the subjects here described were members, two were headed by instructors serving in this double capacity. The assistant teachers in the three groups were all students who had been trained in the critical observation of young children in the field as well as in their college classrooms; all had had teaching experience.

Unless a teacher felt that she had the "thorough acquaintance-ship" already alluded to as essential for reliable rating of the scale, her ratings were not held acceptable for the purpose of this study. For this reason each child was not rated by the same number of teachers, but all were rated by a number sufficiently large to warrant confidence being placed in the averaged results. Two children were rated by four different individuals, 21 were rated by five different individuals, and 13 by six individuals.

That these numbers were sufficient to obtain reliable results is borne out by previous investigators. Rugg (34) felt that an average of three ratings was adequate for practical purposes in education. Remmers, Shock, and Kelly (33) indicated that the average number of raters was 4.7, to obtain a reliability coefficient of .82.

Each of the raters whose judgments were used in the present study had had daily school contacts with the children rated for a minimum of two months prior to the checking of the scale; in several cases the rater had met with the children for a full semester, and in a few instances for an even longer period of time. Some of the teachers had had previous experience in rating; all were carefully instructed regarding the nature of ratings, their limitations and their pitfalls.

Unquestionably the training and experience of the raters would justify an expectancy of high reliability in the results obtained, careful selection having eliminated casual and ill-considered ratings. A statistical interpretation of the results shows them to be acceptable.

The three supervising teachers were asked to re-rate each child four to five weeks after the first rating had been made. They were not told originally that a second rating would be sought. Computation of coefficients of correlation between the two sets of results, by the rank-difference method, showed a fine discriminative ability in their ratings: .96, .88, and .88 were the results of the correlations. These rank-order coefficients were transmuted into product-moment coefficients, according to Table XX in Garrett (18, p. 192). These, with their probable errors, were, respectively,  $.96 \pm .02$ ,  $.89 \pm .05$ , and  $.89 \pm .04$ .

An average of the two ratings of the supervising teachers was found for each subject, and with these averages were correlated the averages of the ratings of the assistant teachers. Here again the resulting coefficients were wholly satisfactory: .94, .87, and .87. Transmuting these rank-order coefficients into product-moment coefficients, as already noted, the agreement is indicated by the following results:  $.95 \pm .08$ ,  $.88 \pm .05$ , and  $.88 \pm .05$ . The coefficients of correlation of the obtained ratings are shown in Table 1.

TABLE 1

## RELIABILITY COEFFICIENTS OF MARSTON PERSONALITY SCALE RATINGS

<i>A. Correlations between First and Second Ratings of Supervising Teachers</i>	
Two ratings of X	$.96 \pm .02$
Two ratings of Y	$.89 \pm .05$
Two ratings of Z	$.89 \pm .04$
<i>B. Correlations between Supervising Teachers' Average Ratings and Assistant Teachers' Average Ratings</i>	
X and X's assistants	$.95 \pm .08$
Y and Y's assistants	$.88 \pm .05$
Z and Z's assistants	$.88 \pm .05$

In Marston's report of the reliability of the scale, he quotes an average correlation of .93 between the two halves of his scale. Determination of the reliability of his raters resulted in an average  $r$  of .71 for ratings by two different individuals (30, p. 47). In somewhat similar investigations, Chassell (13) found an average correlation coefficient of .69 between the ratings of two different judges (p. 46), and Cady (12), making a careful selection of his raters, secured an average  $r$  of .87 (p. 42). Cady observed that "one of the possibilities offered looking toward the improvement of rating undoubtedly lies in the selection of the raters" (p. 32),

and added that while a correlation coefficient of .44 between the ratings of two judges was "fairly certain" evidence of traits in subjects, one of .83 between two raters was "very certain" testimony thereof (p. 34).

It is thus evident that the ratings secured in the present study are very favorable for its purpose and may be utilized in seeking any possible relationship existing between traits of introversion and extroversion as thus measured and attention-span.

The personality ratings of the subjects of the present study show a range of 43.3 to 80.6, with approximately 58 per cent of the group examined placed above 60. As was noted previously, the numerical ratings are indicative of the degree to which the individuals rated exhibit personality tendencies toward introversion and extroversion, as judged on the Marston Scale. A rating of 60 represents a theoretical balance of the two opposing tendencies of introversion and extroversion; a rating of 20 delineates the most extreme introverted tendencies, and a rating of 100 the most extreme extroverted tendencies, which can be indicated by the scale.

The ratings here obtained describe the combined careful judgments of from four to six teachers concerning each individual child and exhibit a statistical reliability sufficiently high to warrant acceptance of the results. The rating accorded each subject was found by first averaging the two ratings made by the supervising teacher and considering this result as one of the several ratings obtained; the number of ratings varied from four to six for the accepted personality indication in each case.

Some preponderance of extroverted tendencies in the children who served as subjects is revealed in the distribution of the ratings for the entire group. We find thirteen children receiving personality ratings between 55 and 65, indicative of a fairly balanced proportion of introverted and extroverted tendencies. Fourteen were rated at or above 65, and nine were rated at or below 54. In other words, 39 per cent of the subjects of this investigation were considered extroverted in their personality characteristics, and 25 per cent were judged introverted, with 36 per cent being rated as approximately normally balanced in such traits, as judged on the Marston Scale.

When each age group is considered, we find ratings tending to increase slightly with increasing age, the three-year-olds rating an

average of 59.8, the four-year-olds averaging a score of 63.4, and the five-year-olds one of 63.2.

In the case of the girls this was more consistent than was found to be true with the boys, the five-year-old boys being rated 65.8, approximately two points lower as a group than were the four-year-old boys, although the latter scored four points more on their average rating, 67.6, than did the three-year-olds, who averaged 63.6. The average rating of the five-year-old girls was lower than the lowest group rating given the boys, the three-year-old boys being adjudged three points higher than the five-year-old girls, 63.6 and 60.6, respectively. The four-year-old girls averaged 59.2, and the three-year-old girls averaged 56.

There is here seen some indication of a trend toward more extroverted tendencies with increasing years, and of consistently more extroverted tendencies in the case of boys as compared with girls, irrespective of age groups. These data are shown in Table 2. Marston (30) reported an average rating of 62.3 for the boys

TABLE 2

AVERAGE MARSTON PERSONALITY SCALE RATINGS FOR EACH AGE LEVEL,  
AND FOR BOTH SEXES AT EACH AGE LEVEL

Age	All subjects	Girls	Boys
3	59.8	56.0	63.6
4	63.4	59.2	67.6
5	63.2	60.6	65.8

of his investigation, and an average of 56.4 for the girls (p. 40). Concerning the age factor, he stated a decrease in extroversion with age in the case of girls, but not in the case of boys (p. 86).

To determine whether any significant relationship existed between the personality tendencies of the children studied and their attention-spans, the ratings of the first, herein reported, were correlated with the measures of the second, which were ascertained by means of the experimental procedure described elsewhere (35).

The attention-span of the subjects was found for both simple and complex situations, and the group studied was divided into age groups—three-, four-, and five-year-olds—and also considered as a unit of preschool-age children. The latter consideration was due to the fact that there were shown for the three year levels



insignificant differences in the time of sustained attention at both the simple and the complex situations presented.

By means of the rank-difference method, coefficients of correlation were found between these two factors, personality tendencies and attention-spans, and these results were transmuted into product-moment coefficients by means of Table XX in Garrett (18, p. 192). These data are shown in Table 3.

TABLE 3

CORRELATIONS BETWEEN AVERAGED MARSTON PERSONALITY SCALE RATINGS AND AVERAGE ATTENTION-SPANS, IN SIMPLE AND IN COMPLEX SITUATIONS, FOR EACH AGE LEVEL, AND FOR THE ENTIRE GROUP

Age	Simple situations	Complex situations
3	.64±.12	.77±.09
4	.60±.13	.80±.07
5	.63±.13	.75±.11
3, 4, 5	.67±.07	.74±.05

A consistent correspondence may be here noted. In the consideration of each age group, it is recognized by the writer that correlation results with such small numbers indicate only a trend toward relationship, not an exact correlation. However, when the entire group is considered, the statistical data are reliable. A coefficient of  $.74 \pm .05$  must admittedly indicate relationship of a sort; surely the suggested tendency of briefer attention-spans associated with extroverted tendencies, and longer attention-spans associated with introverted tendencies, will have to be disproved if no note is to be taken of such results as are here presented.

That a higher correlation is seen in the complex situations than in the simple situations may be indicative of the latter's being less aptly chosen means of measuring attention-span than the former. Another explanation wholly in accord with the ascertained facts is that a consistent positive relationship has been found to exist between attention-span and intelligence (36), although this is not a sufficiently marked relationship to account for individual differences in sustained attention.

Again the writer wishes to state her appreciation of the limitations of the present investigation in making any attempt toward a generalization. Yet it seems obvious that the probability must be considered of some relationship between personality characteristics

and attentive activity, although it is equally obvious that further investigation is necessary before any definite conclusions can be drawn.

Supporting evidence is to be found in the literature, although the material available of even remotely related research is scant.

In 1928, Powers (32), using the Marston Personality Rating Scale and the Stanford-Binet Test in a study of a group of girls, ranging in age from eleven to sixteen, and with intelligence quotients of from 48 to 82, suggested that an individual's tendencies toward extroversion or introversion were not influenced by his intelligence.

Hovey (25) indicated from his investigation, in 1928, of the effects of distraction upon mental processes that intelligence is not related to susceptibility to distraction, and the following year published a report (26) concerning extroversion-introversion tendencies and distraction, suggesting therein the possibility that the extrovert pays more attention to the "primary external conditioners of attention." Hovey used Conklin's Extro-Introvert Interest Ratio, Laird's Personal Inventory, and the Freyd-Heidbreder List of Introvert Characteristics. The Army Alpha Test was the "performance" subjected to distraction.

Goodenough (20), in 1929, considering the emotional behavior of young children, reported that the boys of her study were more distractible than the girls, and presented evidence, too, to show that at every age level investigated—children up to six years were included in the study—*only* children were found to be more flighty and distractible than were children with one or more siblings. True, distractibility was classified by the use of a series of descriptive categories, rather than measured by a purely objective test situation, but the published results may be noted even if not unreservedly accepted. If the findings presented by the present study are accepted, i.e., that boys show more extroverted characteristics than do girls, then Goodenough's report of greater distractibility in boys than in girls may be considered as a possibly causally related trait.

It has already been noted that Marston (30) found the boys of his investigation more extroverted than the girls, in which considerations the results here shown are in agreement. The girls of the present study, however, show increasingly extroverted tendencies with increasing years, with which Marston's findings are not in accord.

In this connection it is of interest to re-emphasize the results in the attention-spans of the girls of the three age levels which have been considered. With the tendency, even slight though it may be, toward exhibiting increasingly extroverted characteristics, evidenced by average Marston ratings of 56.03, 59.20, and 60.68 for the three-, four-, and five-year-old girls, respectively, there are presented the average attention-spans for these subjects: in the simple situations the records (35) show 11'24", 8'1", and 10'12" to represent the periods of sustained attention, while in the complex situations there appear 14'15", 15'28", and 12'27" as the average attention-spans of the three groups of girls. These results have been grouped in Table 4.

TABLE 4  
AVERAGE ATTENTION-SPANS AND AVERAGE MARSTON PERSONALITY  
SCALE RATINGS FOR GIRLS

Age	Average span in simple situations	Average span in complex situations	Average Marston ratings
3	11' 24"	14' 15"	56.03
4	8' 1"	15' 28"	59.20
5	10' 12"	12' 27"	60.68

The writer refrains, however, from drawing any inference from these results. True, there is found at the three- and five-year age levels a slightly decreased attention-span, with a slightly increased Marston rating, but the differential scores vary too little to permit any importance from a developmental standpoint being attached to this inverse relationship.

Indeed, caution in concluding any relationship is imperative, as may readily be seen in considering the comparative results of the boys at the three year levels. Here is found, as in the case of the girls, a slight tendency toward increasingly extroverted characteristics with increasing age, represented by 63.65, 67.63, and 65.80 as the average Marston Scale ratings for the three-, four-, and five-year-old boys, respectively. But with this is to be noted, as was not in the case of the girls, an increasing attention-span, varying through the three year levels from 5'20" to 8'29" to 8'33" in the simple situations, and from 7'49" to 10'23" to 10'1" in the complex situations. These comparisons are shown in Table 5.

TABLE 5  
AVERAGE ATTENTION-SPANS AND AVERAGE MARSTON PERSONALITY  
SCALE RATINGS FOR BOYS

Age	Average span in simple situations	Average span in complex situations	Average Marston ratings
3	5' 20"	7' 49"	63.65
4	8' 29"	10' 23"	67.63
5	8' 33"	10' 1"	65.80

It is the opinion of the writer that the differentiated attention-spans are not particularly significant. Certainly, in actual life situations, it would be folly to attach any importance to whether a child sustained attention 7' 49" or 10' 1". Nor do the Marston ratings show any real change; of what import is it that the average rating on this scale varies two or three or four points? Our measuring instruments of today are not sufficiently delicate to permit any such fine interpretation.

It may be concluded, however, from the experimental evidence gathered and here presented, that girls exhibit somewhat longer periods of sustained attention than do boys, and that girls exhibit somewhat more introverted tendencies than do boys, when subjected to such investigative procedure as has been described. While there may not be inferred any particular developmental evidence as inherent in the present findings, as differential for the three year levels considered, there is apparent a constant relationship between the sustaining of attention and the manifestation of personality tendencies as judged by the Marston scale: Extrovertive characteristics are associated with a short attention-span, and introvertive characteristics are associated with a long attention-span.

Similar investigations might profitably be carried through with other groups of preschool children, either to confirm or negate the meager evidence herein presented. Further investigation with the measures utilized, with subjects in much larger numbers than have here been described, is essential before it can be ascertained whether or not the obtained evidence is of value for use in social and educational procedures with preschool children.

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# LES TENDANCES DE PERSONNALITÉ ET L'ATTENTION SOUTENUE CHEZ LES ENFANTS DE L'ÂGE PRÉSCOLAIRE

(Résumé)

Les rapports des études des différences dans l'activité attentive des jeunes enfants contiennent des témoignages en conflit à l'égard du facteur causal ou facteurs qui gouvernent l'étendue de l'attention; on a suggéré

l'intelligence, l'âge, le sexe, et le nombre d'enfants dans la famille pour expliquer les différences notées. Cette étude-ci contient de l'évidence qui montre que la vraie cause fondamentale de la différence dans le comportement attentif des enfants de l'âge préscolaire se trouve dans les différences de personnalité.

Les sujets de cette étude ont été trente-six enfants, âgés de trois, quatre et cinq ans. Le degré de relation existant entre les tendances de personnalité des sujets et leur étendue d'attention ont été trouvés au moyen de la comparaison des données des traits introvertis et extrovertis, déterminée par l'Echelle d'Evaluation de la Personnalité de Marston, et les données sur l'attention soutenue, mesurée par une expérience faite par l'auteur.

Une relation constante se montre entre la manifestation des tendances de personnalité et le soutien de l'attention, les caractéristiques extroverties étant associées à une courte étendue de l'attention, et les caractéristiques introverties à une longue étendue de l'attention.

SHACTER

## PERSÖNLICHKEITSNEIGUNGEN UND DAUERAUFMERKSAMKEIT BEI VORSCHULPFLICHTIGEN KINDERN

(Referat)

Mitteilungen über Untersuchungen von Verschiedenheiten in der Aufmerksamkeit junger Kinder enthalten widerspruchsvolle Evidenz in bezug auf ursächliche Momente oder Momente, die den Aufmerksamkeitsumfang beeinflussen; Intelligenz, Alter, Geschlecht, und Zahl der Kinder in der Familie wurden vorgeschlagen als Erklärung der gefundenen Verschiedenheiten. Der vorliegende Artikel enhät Evidenz, dass die unterliegende Ursache des verschiedenen Verhaltens der Aufmerksamkeit bei vorschulpflichtigen Kindern an der Persönlichkeitsverschiedenheiten liegt.

Die Vpn. der vorliegenden Untersuchung waren sechsunddreissig Kinder im Alter von drei, vier, und fünf Jahren. Der Grad des Verhältnis der Persönlichkeitsrichtungen der Vpn. und ihres Aufmerksamkeitsumfanges wurde durch Vergleich der introvertierten und extravvertierten Züge nach der "Marston Personality Rating Scale" mit den Daten der Daueraufmerksamkeit, die in einem vom Verfasser aufgestellten Versuch gemessen wurde, erhalten.

Ein konstantes Verhältnis zwischen den Aeusserungen der Persönlichkeitsrichtungen und der Daueraufmerksamkeit war augenfällig, indem extravvertierte Züge mit dem kleinen Aufmerksamkeitsumfang und introvertierte Züge mit dem grossen Aufmerksamkeitsumfang in Wechselbeziehung standen.

SHACTER

# THE DIFFERENTIAL DECLINE OF LEARNING ABILITY IN THE AGED AS A POSSIBLE EXPLANATION OF THEIR CONSERVATISM\*<sup>1</sup>

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Modern biology conceives of senescence as an increase in the stability of the chemical organization of tissues consequent upon increase in chronological age. Learning, regardless of the nature of the neural phenomena underlying it, must involve changes in the organization, chemical or anatomical, of neuromuscular tissues. These considerations lead us to expect a general impairment in ability to learn during old age. That our expectation is true to the facts has been shown by a number of researches upon human subjects. Those researches deserving especial mention are the ones carried out by Snoddy (10), Peterson (7), Husband (2), Tachibana (16), Thorndike (17) and his associates, and certain of the workers on the Stanford Later Maturity Project so ably directed by Walter R. Miles (5). Stone (12, 13) has shown that a comparable relationship between age and learning ability exists in the white rat, a result which is in essential agreement with the less extensive research of S. Y. Liu (4). If the term learning be expanded to include immediate memory as implied in *aussage* experiments, digit span and related performances, we can draw upon further sources such as the work of Jones (3) and his associates. It is not, however, my purpose here to give an extended review of the experimental literature which I have attempted to summarize, evaluate, and, in certain instances, criticize in a current number of the *Psychological Bulletin* (9). The preponderance of evidence from this not inconsiderable body of data vindicates our first expectation that there is a decline with the coming of old age in efficiency in learning practically all kinds of materials.

Our second deduction from the current conception of the biologi-

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cal nature of senescence, on one hand, and the probable nature of the neural mechanisms underlying learning, on the other, is that there should exist a differential rate of decline with age in learning efficiency as a function of the type of material learned. That is to say, the aged might be expected to continue to learn certain tasks with youthful efficiency when other tasks are learned with increased difficulty. That such a relationship might exist has been hinted at here and there in the experimental literature but had not been definitely demonstrated prior to the time of the experiment to be reported here.

Since my experiment has yielded results essential to the development of the main thesis of this paper, it will be described briefly. A fuller account of this experiment has been given elsewhere (8).

Three age groups were employed. Each group contained 40 individuals selected in such a way as to be comparable as to social background, native ability, and willingness to participate in the experiment. The youngest of the groups ranged in age from 12 to 17 years; the middle-aged group contained individuals aged 34 to 59 years; while the oldest group was made up of subjects whose ages fell between 60 and 82 years. All subjects were caused to learn five different types of material under objective conditions held constant for all groups. The learning tasks were chosen to require for their mastery differing amounts of reorganization of pre-existing neuromuscular patterns. That is to say, the tasks were selected because they seemed to vary in amount of dependence upon the previously established habits or associations of the learners.

Two of the five tasks were of the motor learning variety. In the first of these the subject was seated before a specially designed pursuit rotor whose disc rotated only when an electrode held in the hand of the subject was kept in contact with a small metal button flush with the surface of the rotor disc. All subjects worked for 25 periods of 30 seconds each, separated by a rest period of the same length. The score was defined as the total number of rotations accomplished during the trial series. Such a score, obviously influenced by the initial performance of the subjects as well as by their speed of learning, is open to a certain amount of criticism. In this task, it was felt, the previously acquired eye-hand coordinations of the subject would be of value, i.e., past experiences would be expected to facilitate learning.



In the second motor task the same apparatus was used with the same schedule of work and rest, the only difference being that the subject was required to follow the rotor disc not in direct vision but in mirror vision. It was argued that this type of learning would be interfered with by the previously acquired direct-vision reaction patterns of the subject. In other words, this second motor task involves learning which demands the tearing down of old and established reaction patterns.

Three verbal tasks were employed. The first of these consisted in learning by the anticipation method a list of ten pairs of meaningful associates such as: *horse-sheep*, *stem-bud*, *white-pink*, etc. It was argued that old associations would facilitate learning of this sort.

The second verbal learning task consisted in learning nonsense materials presented in the form of simple equations in which all of the terms were letters:  $B \times D = M$ ,  $F \times P = V$ . The part to the left of the equality sign was presented first and the subject was required to give the answer before it appeared in the window of the exposure apparatus. This is the same general type of material which Thorndike has used to measure what he chooses to call sheer modifiability. With materials of this sort the past associations of the subject should neither facilitate nor interfere with learning.

The nature of the material employed in the third verbal learning task differed from that of the others in the important respect that its mastery involved the temporary suppression of old habits of life-long standing. This third task consisted in learning false multiplication tables such as:  $2 \times 4 = 9$ ,  $5 \times 4 = 14$ .

All verbal materials were presented slowly enough to give all of the learners ample opportunity to read the items and attempt to anticipate the paired associate. The subjects were required to read the items aloud as they appeared. This was done as a means of insuring that they were working at their task and not daydreaming in front of the apparatus. The score on the verbal test was the number of items correctly anticipated in 15 showings of the 10 pairs of associates.

According to the hypothesis presented at the beginning of this paper the aged as compared with the younger learners should encounter greater difficulty in learning those materials which demand a tearing down of old habits. This was indeed the case. The older



learners, those aged 60 to 82 years, were inferior to the young and middle-aged learners on all tasks, but their deficit was greater in the mirror-vision learning than in the direct-vision learning. Comparable results were obtained with the verbal materials. The deficit of the aged was greatest for the false multiplications, less for the nonsense materials, and least of all for the meaningful associates.

Several methods of analyzing the data agree in giving this order of deficit. The simplest of these consists in determining the percentage of the old group of learners which equalled or exceeded the average performance of the younger group. This analysis shows that 11.1% of the old group equalled or exceeded the mean of the young group in direct-vision learning while but 2.5% of the old group overlapped the mean of the younger subjects on the mirror-vision variation of the task.

The extent of overlapping of the mean of the young by the old group was 10.8% for the meaningful materials, 7.5% for the nonsense materials, and 2.5% for the learning of the false multiplication items. When the old learners are compared with the middle-aged the same order of deficit occurs but to a less marked extent.

Since more adequate statistical procedures, requiring too much space to be discussed here, yield the same results as those of the simpler method of analysis, we seem justified in concluding from this experiment that the aged learners, as compared with adolescent or middle-aged ones, encounter greater difficulty in learning tasks which would appear to demand extensive reorganization of habit patterns than they encounter in such types of learning as might be regarded as involving the perfection of habit patterns already built up.

The experimental facts seem clear enough but any attempt to go beyond them and appeal to the nervous system as an explanation is of necessity highly speculative. Snoddy has investigated learning behavior in large and varied age samples with his mirror-drawing technique. He was able to discern two phases of the learning curve picturing progress in mirror drawing. The first, or adaptation, phase corresponds to a rapid increase in efficiency of performance which Snoddy thinks might be due to growth of neural processes in the manner implied by Kappers' theory of neurobiotaxis. The second, or facilitation, phase pictures a slow regular increment in performance and is held by its discoverer to have a neurological founda-

tion in a sort of condensation effect. Adults and more especially senescent and senile learners give learning curves which resemble the facilitation phase of the learning curves of young subjects.

I feel that Snoddy's interpretation of his experimental findings is illuminating and suggestive, but I am also convinced that his logic could be expanded to encompass certain other theories of the neural basis of learning.

The title of this paper implies a promise to employ the fact of differential decline in learning ability during old age in the explanation of the characteristic conservatism of that period of life. In so far as I am aware no previous formal effort of this sort has been made. Moore (6) has mentioned individual differences in the nature of the neuromuscular organization as a possible explanation of differences between the conservatives and the radicals in a group of college students. The class was tested as to conservatism and radicalism by means of a questionnaire in which they were asked to indicate their attitude toward such affairs as the League of Nations, the Russian experiment, etc. From a population of 225 the 30 most radical and the 30 most conservative students were selected and studied by means of four experimental techniques. The radicals were found to be more efficient than the conservatives in mirror drawing, a type of learning involving the tearing-down of old habits. In a card-sorting test patterned after that of Münsterberg, in which speed and accuracy were variables whose relative importance was unknown to the subject, the radicals worked faster than the conservatives. The radicals were also faster than the conservatives in simple reaction-time tests. It was discovered, moreover, that the radicals gave more idiosyncratic responses to the 100 stimulus words of the Kent-Rosanoff list than did the conservatives. These findings, Professor Moore argued, can be explained by assuming that the radicals have a neuromuscular system which is more plastic than that of the conservatives. Unfortunately, Washburn (18) and her students were unable to verify these results in experiments with college women. Even though we admit the insecurity of the experimental facts, it is none the less stimulating to attempt a similar explanation of the conservatism of the aged.

At this point I must confess a certain amount of embarrassment. I find myself in the rather dubious position of one who attempts

to explain something which has not yet been scientifically demonstrated, popular belief notwithstanding.

Are adults more conservative than children? In certain respects the adolescent child appears to be more conservative than the adult who by virtue of his wider experience sometimes feels that that which is is not of necessity right. Conservatism is here defined as an attitude of resistance to change. A conservative is thus one whose interests and likes and dislikes are permanent. He is one is unwilling to experiment with new institutions and is, in fact, more than willing to let well enough alone.

Goodwin Watson (19) has shown that Methodist ministers over forty years of age are more closed-minded than younger ministers of the same Protestant faith against modernism in religion, Catholicism, and revision of our moral standards. The older ministers, on the other hand, show more prejudice than the younger ones in favor of Fundamentalism in religion and Puritanism in morals. Interestingly enough, no consistent age differences were found in amount of prejudice for or against economic reform. We should not, however, judge all mankind by Methodist ministers.

Harper (1a), I am gratified to report, found American educators aged thirty-five to forty-five to be only slightly more conservative in their social beliefs than younger members of the profession. But I must ask: should we judge the generality by a group whose mission in life foreswears them to critical examination of their own prejudices as a matter of intellectual honesty and whose profession carries with it the obligation to keep on learning? Sorenson (11) has shown that adults who keep active intellectually suffer less decline in learning ability than those who relinquish efforts to learn. Arnett (1) found that conservatism in a group of 1051 school-board members as measured by the Harper Social Belief and Attitude Test slightly increases with advancing maturity between the ages of thirty and seventy years.

Perhaps the most compelling evidence now available is to be drawn from the researches of Strong (14, 15), who finds that likes, dislikes, interests, and ambitions change less between the ages of twenty-five to sixty-five years than between the ages of fifteen and twenty-five years! That his populations included representatives of several of the more important walks of life argues for the general conclusion that the aged tend to maintain the *status quo*.

This increase in conservatism which comes with old age must depend upon a loss of plasticity in the neuromuscular tissues themselves. As a consequence of this loss the aged become increasingly less able to learn new materials or more especially materials demanding the tearing down of old habits of reaction and are accordingly limited in their thinking to the use of experiences acquired in the past. The further a proposed change or reform deviates from their past experience the harder it is for them to grasp its significance or appreciate the need of it. In the present period of rapid flux when morals are changing, when governments are experimenting with methods of social control hitherto unattempted, when broad human values are being rapidly revised, a certain measure of conservatism would seem to be a part of the biological heritage of senescent man.

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# LA DIMINUTION DIFFERENTIELLE DE LA CAPACITÉ D'APPRENDRE CHEZ LES VIEUX COMME EXPLICATION POSSIBLE DE LEUR CONSERVATISME

(Résumé)

La biologie moderne considère la sénescence comme une augmentation, avec l'âge, de la stabilité de l'organisation des tissus. L'apprentissage, quelle que soit la nature de ses phénomènes nerveux fondamentaux, doit comprendre des changements dans l'organisation ou anatomique ou chimique des tissus neuro-musculaires. Cela nous fait compter sur: (1) une diminution générale avec l'âge de la capacité d'apprendre chez les adultes; (2) une plus grande diminution, chez les vieux, dans l'apprentissage qui comprend une réorganisation étendue des formes des habitudes qui existent auparavant que dans l'apprentissage de nouvelles habitudes qui ne s'opposent pas aux anciennes.

Quelques expériences dans l'apprentissage avec deux types de tâche motrice et trois types de matière verbale soutiennent les deux parties de cette hypothèse.

La difficulté éprouvée par les vieux dans l'apprentissage des habitudes verbales et motrices qui s'opposent aux habitudes préalablement acquises, plus grande que celle éprouvée dans l'apprentissage des habitudes qui exigent simplement la modification des habitudes qui existent auparavant signifie que les vieux sont forcés de réagir en termes de l'acquisition passée. En temps de mouvement rapide quand les institutions humaines se changent les vieux sont forcés vers le conservatisme à cause de la diminution de leur capacité d'apprendre et surtout à cause de celle de l'apprentissage de la matière qui s'oppose à leurs habitudes du passé. Le conservatisme semblerait ainsi être une partie de l'héritage biologique de l'homme sénescant.

RUCH



DIE DIFFERENTIALABNAHME DER LERNFÄHIGKEIT BEI DEN  
BEJAHRTEN ALS EINE MÖGLICHE ERKLÄRUNG FÜR  
IHREN KONSERVATISMUS

(Referat)

Die moderne Biologie betrachtet das Altern als eine Zunahme der Stabilität der Gewebeorganisation. Das Lernen, unbeachtet der Natur seiner zugrundeliegenden Nervenerscheinungen, muss Veränderungen entweder in der anatomischen oder chemischen Organisation der Nerven- und Muskelgewebe aufweisen. Dies zwingt uns zu erwarten (1) eine allgemeine Abnahme der Lernfähigkeit bei Erwachsenen mit zunehmendem Alter; (2) eine grössere Schwierigkeit beim Lernen in den Bejahrten, welche eine umfassende Neugestaltung vorher vorhandener Gewohnheiten erfordert, als beim Lernen neuer Gewohnheiten, die den Alten nicht entgegenwirken.

Lernexperimente mit zwei Arten von motorischen Aufgaben und drei Arten von Sprechmaterial bestätigen beide Teile der obigen Hypothese.

Die grössere Schwierigkeit, die die Bejahrten beim Lernen Verbal- und Motorgewohnheiten, die den vorhererworbenen Gewohnheiten entgegenwirken, als beim Lernen Gewohnheiten, die bloss eine Veränderung vorherbestehender Gewohnheiten erfordern, bedeutet bloss, dass die Bejahrten in bezug auf das Vergangene zu reagieren gezwungen sind. In einer Periode rascher Veränderung, werden die Bejahrten in den Konservatismus durch ihre verminderte Lernfähigkeit gezwungen, und besonders durch die Unfähigkeit, neue Sachen zu lernen, die ihren alten Gewohnheiten entgegenwirken. Der Konservatismus scheint daher ein Teil des biologischen Erbguts des alternden Menschen zu sein.

RUCH

# RELIABILITY OF OPINIONAIRE TECHNIQUE STUDIED INTENSIVELY BY THE RETEST METHOD\*<sup>1</sup>

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THEODORE F. LENTZ, JR.

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If measurement is as essential in social science as in the physical sciences there is justification for much more detailed attention to the adequacy of such instruments as purport to measure character. A generalized problem related to this adequacy is that of technical reliability. The problem of reliability may vary with the technique. Looking at our present instruments from the psychological rather than from the statistical point of view one observes as one of the most frequent techniques that of the opinionaire. Whether it be one of the Thurstone series of attitude scales or Watson's ingenious test of fair-mindedness or the Vernon and Allport scale of values, the essential point is that some attitude or other character aspect or behavior tendency is deduced from opinions held or apparently held by the subject. As pointed out by Thurstone (6), there must be a vital relation between one's opinions and one's attitudes or, as the anti-traitists would prefer to have us say, between one's opinion behavior and his other behavior. In fact, it is hard to conceive of any aspect of character not reflected somehow somewhere among our multitudinous opinions. Or, conversely, what opinion can anyone have which is not in part or in whole the resultant of one or more of his complex or simple attitudes? If these observations are correct, much energy and time will be expended in the making of a great many opinionaires yet to appear. These will continue to be greeted with enthusiasm and suspicion

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<sup>1</sup>This article has been made possible by the cooperative effort of several persons. M. Wallace Major and Herbert Friesen, students in a measurement course, who carried out a preliminary study, paved the way for the more extensive data here presented. H. Stammer, H. Hunnicott, U. Handy, G. Vahrenkamp, and Robert Sorrels gave long hours of patient tabulation and compilation of data. U. Handy aided in the preparation of the manuscript.

by both lay and expert observer. Need the critical questions be repeated?

Has the subject sincerely expressed his real opinion? Will the subject behave overtly consistently with his expressed opinion? Does the subject really have an opinion on this subject and does he know what it is? Will he give the same opinion under similar circumstances on a later occasion? The pertinency of these and other questions and their true answer will depend in part upon the nature of the topic and the manner in which the opinions are chosen and validated. It seems to the writer that some of the criticism is answered in the reliability coefficients which are experimentally obtained. More answers may be received by more intensive study of different methods for measuring reliability. We have taught our students to differentiate sharply between reliability and validity. However, reliability study is conceivable as a step in the direction of validation, since the absence of reliability necessitates the absence of validity and the presence of reliability makes validity possible. However, reliability can be studied and measured in such a way as to throw even more light upon validity. For instance, reliability coefficients between parts of tests given at the same sitting and between the same parts with a lapse of time should tell whether the factor measured fluctuates with time. One such study carried on by Voigt (7) under the supervision of the writer showed a correlation of  $.72 \pm .01$  between two short forms of a happiness test when given on the same day and  $.71 \pm .01$  when given 28 days apart, indicating that the thing measured was not mood or at least not subject to fluctuation in 28 days any more than in a half hour.

The study herein described arose out of the criticism that answers to either opinionaires or questionnaires are the result of momentary impulse and decision and at a later date would be answered differently. It is made in part for the layman who cannot accept the simple reliability coefficient as proof against the above criticism, as well as for the benefit of the test engineer who is interested in weighing these criticisms. To what extent do people contradict themselves on a retest? What is the effect upon the individual score? Upon the reliability coefficient? What causes these contradictions? Is their explanation in the nature of the person or the nature of the opinion? I.e., does the frequency of contradiction vary with the individual person or with the item of the test? Or both?

## SET-UP OF EXPERIMENT

Fifty-seven students, 13 men and 44 women, in Educational Psychology were given an opinionaire designed by the writer to measure conservatism. One month later they were given another copy of the same test. In both instances the tests were taken outside of class.<sup>2</sup> This test consists of 200 statements of opinion which are reproduced in full at the end of this paper. This test will hereinafter be referred to as the Social Science Opinionaire or as the Opinionaire. At certain points the reader will need to bear in mind that it is designed to measure conservatism. The conservatism score accrues as the subject agrees with conservative statements and disagrees with radical statements.<sup>3</sup> As a check upon the more intensively studied data of the Social Science Opinionaire, we are reporting similar data upon Bernreuter's Personality Inventory<sup>4</sup> designed to measure neuroticism, self-sufficiency, introversion, and dominance. To each of the 125 questions of this Inventory the subject is requested to circle one of three terms—yes, no, ?. This test was likewise presented twice with a lapse of time varying from one week to four weeks between the two takings. With this instrument some of the subjects took the test in class and some out. These data will be distinguished from the Opinionaire data by the term Inventory or Personality Inventory. Practically all data secured for the Inventory were secured for the Opinionaire but not all Opinionaire data are paralleled by Inventory data. As far as it goes the Inventory data corroborate the Opinionaire data very closely and have the advantage of the greater number of cases, representing reactions of 139 students in a beginning course in Educational Psychology. Forty-nine of these were men and 90 were women. Neither the nature of the tests nor the purpose of the experiment were discussed with the subjects until after the second taking.

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<sup>2</sup>In the interest of another study on the practice effect of the test a slight variation was arranged for the two takings. The test consists of two forms, H and I, 100 items to each form. When administered the first time, half of the class were presented with H followed by I, both clipped together, and with I followed by H for the second taking. The reverse procedure was followed for the other half of the class—IH for the first taking and HI for the second. The writer does not believe this affected the total results here reported but offers this in the interest of scientific caution.

<sup>3</sup>For discussion of this technique in more detail see Lentz (4).

<sup>4</sup>For further discussion of this test the reader is referred to Bernreuter (2).

## TOTAL NUMBER OF CHANGES

In analyzing the data our first notation relates to reversals of reaction on individual items by individual students. For instance, with reference to the Opinionaire statement No. 10 that "Much more energy should be expended in conserving what mankind does know than in discovering what is not known," subject L.W. reacted with a plus mark the first taking and with a minus the second. Likewise, referring to the question in the Inventory No. 11 "Do you try to get your own way even if you have to fight for it?" student D.M. reacted by circling "yes" the first time and "no" the second, whereas student M.H. circled "?" the first time and "yes" the second. For 57 students taking the Opinionaire the second time such reversals were made 2241 times out of a total of 11400 reactions, or 19.6%. If, for every reversal on this two-way test, we assume another reaction which would have been shown to be a reversal except for chance,<sup>5</sup> the total percentage of unreliable responses on the first test as judged by the second would be nearly 40 leaving a matter of approximately 60% as the most probable number of first reactions which can be taken reliably to represent the subjects. Of these shifts or reversals, 1001, or 44%, were from agreement to disagreement (+ to —) and 1134, or 50%, were from disagreement to agreement (— to +). About 5% had to do with omissions on one of the takings. As to the meaning of these shifts, 1007, or 44.9%, were from radical to conservative and 1234, or 55.1%, from conservative to radical. To some extent the subjects seem to find their disagreements to statements less tenable than their agreements and their conservative positions less tenable than their radical ones. For the Personality Inventory the total number of shifts was 3446 out of a total of 17375 reactions, or 19.8%, approximately the same as in the case of the Opinionaire. Of the original Inventory reactions the "yes," "no" and "?" reactions were changed as follows: yes, 17.4%; no, 15.8%; and ?, 68.2%, showing the least tendency to change "no's" and the greatest tendency to change the "?s." The total number of reactions of each class is given in Table 1.

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<sup>5</sup>If for instance, there were 80 items concerning which a particular student was devoid of knowledge, conviction, or memory he could be expected on the average to mark on the occasion of the second test 40 items differently and 40 similarly to his first reaction.



TABLE 1

	Yes	No	?
1st taking	8137	8151	1087
2nd taking	8016	8417	942

## "CHANGE" SCORES

Inquiring whether these changes are a function of the individual, we have the figures shown in Table 2.

TABLE 2  
NUMBER OF SHIFTS PER PERSON

	Opinionaire	Inventory
Range	17-81	0-61
Mean	39.32 (200 items)	24.79 (125 items)
Reliability of "change" score	.66±.05 (100 odd) (vs. 100 even items)	.63±.05 (63 odd) (vs. 62 even items)
Corrected for 125 items		.775 .027
Corrected for 200 items	.795±.035	.83±.02

Which, being interpreted, means that on the Opinionaire one student, who made the least change, shifted on only 17 items, but another, who made the greatest number of changes, shifted on 81 and that the average is 39 for all 57 cases; similarly for the Inventory.

These reliability coefficients of measures of change in reaction are very high considering that the tests were not designed to measure this factor of shift or variability. The Spearman-Brown corrections for the Opinionaire and Inventory of .795 and .775 respectively are odd-even reliabilities corrected to original length of test, 200 items for the Opinionaire and 125 for the Inventory. The .83 is to make the Inventory and the Opinionaire comparable. However, the writer is skeptical of the reality of this reliability of change score until it is obtained by the method of change of occasion—that is by corroboration of similar scores obtained at another time. This will require that we give to the same subjects either the same test a third

time or another test of the same sort twice. The  $r$  between these two "change" scores (Opinionaire and Inventory), for 50 additional cases who took both tests, is  $.358 \pm .083$ . The probable error is too high for any conclusion, but the best speculation is that, while variability in answering an opinionaire may be a reliably measurable function of individuals, it is not identical with variability in answering a personal data sheet.

Thus far the critic is right who says that our instruments are unreliable. Contradictions do occur—and a great many.

### SCORE CHANGE

Before we look into the correlates and possible causes of these "change" scores let us look at their effect upon the individual scores for which the test is devised. Considering that the average "change" score with the Opinionaire retest is 39, what is the score change or change in conservatism score? By disagreeing to the Opinionaire statement No. 30, "Taxation should be used to mitigate economic inequalities and to secure the greater socialization of wealth," subject M.T. disagreed and was scored conservatively on the first taking, but agreed and scored radically the second; and conversely to item No. 63, "The average person needs greater daring more than greater caution." As far as these two items are concerned, she adds two points to her "change" score, but her conservatism score is not affected. Looking at all of her reactions she makes 39 changes toward conservatism and 27 towards radicalism, thus raising her total conservatism score 12 points. The change score of G.M. is 38. On 19 of these items the change raises the conservatism score, and on 19 it is lowered. Thus her change in score is zero. Subject I.M. makes 62 changes. Since 38 of these cancel each other, his change in score is 24. Taking the sum of all individual changes in score we have 432.5 as over against a total of 2241 individual item changes. This is 19%. This means that 81% of all changes neutralize each other. The mean change in conservatism score is 7.6 with a range of from 0 to  $26\frac{1}{2}$ . The average change of 7.6 is .28 of the sigma of the original conservatism scores. The sigma of the conservatism scores (first taking) is 27. The reliability of change in score by the odd-and-even method is  $.758 \pm .043$ . This reliability coefficient of .758 means that these various scores which we have on these 57 subjects are measures of something real and not

a function of chance factors. The reality of these measures of change in score between the two takings indicates that this instrument, consisting of 200 opinions, is more reliable as a measure of Conservatism for some subjects than for others.<sup>6</sup>

The correlation between the "change" score and the score change is  $.40 \pm .07$ . When corrected for the unreliability of the two measures this becomes about .52, indicating a real degree of relationship between the two. The changes in reaction affect the total score for which the test is designed, but not as much as one might assume looking at the very large percentage of changes and the individual "change" scores.

### THE RETEST RELIABILITY COEFFICIENTS

A further measure of the effect of these changes upon the test score is found in the retest coefficient. This for the Opinionaire is  $.94 \pm .01$ . The retest correlations of the two instruments with their respective odd-even reliability coefficients are presented in Table 3.

TABLE 3

	Retest reliability	Reliability—odd-even Spearman-Brown corrections	
		1st taking	2nd taking
<i>For the Opinionaire</i>			
Conservatism score	$.94 \pm .01$	$.942 \pm .010$	$.969 \pm .005$
Acquiescence score	$.78 \pm .03$	$.85 \pm .027$	$.88 \pm .021$
<i>For the Inventory</i>			
Neurotic score	$.92 \pm .01$	$.91 \pm .010$	$.92 \pm .009$
Self-Sufficiency	$.91 \pm .01$	$.87 \pm .015$	$.90 \pm .011$
Introversion	$.90 \pm .01$	$.86 \pm .016$	$.93 \pm .008$
Dominance	$.915 \pm .01$	$.90 \pm .011$	$.916 \pm .009$

<sup>6</sup>These measures of change in score might be conceived as individual measures of reliability of the test, i.e., measures of reliability of the test for the individual. We may say that the reliability of these measures of reliability is .758.

Ignoring the acquiescence measure,<sup>7</sup> the correlations between scores of the two givings run from .90 to .94. The retest  $r$  seems to be high when the odd-even reliability is high. The greatest exception to this is found in the acquiescence measure where it would appear that we have the greatest fluctuation in mood from one taking to another. Incidentally, it seems interesting to note that in each case the reliability (odd-even technique) is higher on the retest than on the first taking. How this affects validity can only be conjectured. It has been suggested that since this increased reliability may be a function of greater intellectualization it may mean lessened validity; since valid character tests should measure the emotional rather than the intellectual. However, on the Opinionaire we note increased range with the second giving—the two sigmas being 27 and 30 respectively. While not statistically certain, there is some indication that upon retest the conservatives appear more conservative and the radicals more radical.

These retest  $r$ 's of .94 to .90 are in striking contrast to the 20% contradiction of individual items. This should be no surprise to the psychometrician who knows his test theory—but it should be an object lesson to illustrate to students the fundamental basis behind practically all measurements of intelligence, knowledge, and character, namely, that *a single reaction of a single individual* gives us no reliable information, but only when we make a *summation of a sufficiently large number of reactions do we obtain reliable scores*. It is said that "the whole is not equal to the sum of its parts." However, only by some method of summing parts do we get meaning into the whole. Nobody ever came to know what life is or what a molecule is instantaneously but only with the cumulative effect of impression after impression. So, in a test by summing up the parts or separate reactions of an individual do we get a meaning of a larger whole. The awareness of anything as a whole is by way of the summation of its parts. An essential feature in all measurement is this feature of summation. Subjective judgments or hunches obscure this feature and in like proportion are accompanied

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<sup>7</sup>This use of the test to measure acquiescence or yesness is a by-product of the conservatism Opinionaire. The score on this measure is simply the number of plus marks on the paper. Since the test is designed to have as many radical statements as conservative, the acquiescence tendency does not affect the conservative score. The intercorrelation of the two scores is zero.

by inaccuracy or unreliability. Which parts to summate as significant for understanding which whole and how to summate them is the eternal quest of character-measurement research.

The following intercorrelations<sup>8</sup> (Table 4) of the odds and evens of the two givings are interesting as showing the relative effect of change of occasion and change of content upon the measure of the individual in lowering the  $r$  below unity.

TABLE 4

	Av. of two $r$ 's	
Different content		
O <sub>1</sub> vs. E <sub>1</sub>	.89±.018	.915
O <sub>2</sub> vs. E <sub>2</sub>	.94±.01	
Different occasion		
O <sub>1</sub> vs. O <sub>2</sub>	.93±.014	.92
E <sub>1</sub> vs. E <sub>2</sub>	.91±.01	
Different content and occasion		
O <sub>1</sub> vs. E <sub>2</sub>	.82±.03	.85
E <sub>1</sub> vs. O <sub>2</sub>	.88±.03	

The sub-numerals 1 and 2 refer to the first and second givings. The O and E refer to the odd- and even-numbered items. The first two  $r$ 's are each between different parts of the test taken at the same time. The next two are each between two givings of the same items a month apart. The last two  $r$ 's are each between different parts taken at different times. From this it appears that for this test change of content and change of occasion are about equally important in affecting the coefficient and that the combination of the two is doubly so. Perhaps by this method someone can develop a formula for equating or reducing to a common basis for purposes of comparison the reliability coefficients obtained under any one of the three methods—split-half, retest, or two forms taken at different times. Such a formula would have to include the number of items as one variable. In this study the split-half test is no more severe than the repetition test<sup>9</sup> but the alternate forms at different times is the most severe test of reliability of the three.

<sup>8</sup>These are uncorrected but all sub-groups are comparable, consisting of one hundred items each.

<sup>9</sup>Kelley (1923, pp. 203-104), from theoretical considerations, thinks that odd-even technique should be more severe than retest.



## CORRELATES OF CHANGE

In order to make clear the purport of our next series of data let us recapitulate by saying that we have found a high but not perfect correlation between the two givings as shown by the retest  $r$  and by an average score change of 7.6, which is .28 sigma of the distribution of original scores. All of this reliability is in contrast with an actual "change" score equal to 20% of all reactions. In other words the number of changes did not invalidate the test, but it did affect it some. If these changes in individual reactions could be better understood possibly we could reduce them and thus increase further the reliability of such instruments. What are the causes of these changes and the resultant change in total score? To this end let us look, first, at the correlates of the "change" score and, secondly, at the correlates of score change.

Since there are these very considerable individual differences in number of changes we have clearly before us the problem of finding other aspects of personality with which these differences may be correlated. What other variables may show themselves to be correlated with this variable of variability? To answer this question fully several thousand  $r$ 's might have to be ascertained. The  $r$ 's here presented do not represent a systematic attack upon this problem but represent merely the utilization of such data as happened to be at hand. Were resources adequate one might seek answer to such questions as the following: Is this variability of the individual related to intelligence, to honesty, to cooperativeness in general or toward the investigator, to his score on the test, to extroversion, to education, age, sex, etc.? Answers to some of these questions are suggested by the following correlations.

For the Opinionaire data we find the highest  $r$  between "change" score and proximity of conservatism score to 100, which is  $.51 \pm .065$ .<sup>10</sup> A conservative score of 100 is the most likely score one would get by chance considering that the test consists of 200 two-way items. Reasoning further we would say that whatever caused one's score to approach the chance amount also caused the number of changes to increase. Speaking somewhat more speculatively, we might say that the persons making the higher change scores are more indifferent to the test, lack appreciation of or sympathy with the

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<sup>10</sup>The  $r$  between change in conservatism score and proximity of conservatism score to 100 is  $.12 \pm .09$ .

objective method in this field, have less of the social scientific attitude, are less sincere while taking the test. Our next highest  $r$  is  $-.345 \pm .089$  with the Otis Intelligence test scores. This may mean that some of the terms, concepts, or issues are not clearly within the knowledge or comprehension of some of the subjects. This relationship is low with a high probable error. This factor of intelligence is even less apparent in the case of change score on the Inventory, showing an  $r$  of  $-.10 \pm .07$ . Other but lesser  $r$ 's with "change" score on the Opinionaire are given in Table 5. The dif-

TABLE 5

<i>vs.</i> Introversion	$-.28 \pm .07$
Deceit	$.14 \pm .09$
Conservatism	$.14 \pm .09$
Religiousness	$.13 \pm .09$
(Wilson's test of Religious Experience)	
Happiness	$.03 \pm .10$
(Writer's Happiness Test)	
Sex: mean for males	38.92
mean for females	39.43

ferences between sexes are also given, but are so slight as to amount to no difference.

For the Inventory "change" score the  $r$ 's are as follows (Table 6).

TABLE 6

<i>vs.</i> Dominance	$-.26 \pm .05$
Neuroticism	$.14 \pm .05$
Introversion	$.12 \pm .05$
Self-sufficiency	$-.08 \pm .05$
Sex: mean for males	28.55
mean for females	22.74

The males are 25.55% more variable. The difference between the means is 3.63 times the sigma of the difference of the means. In other words, the difference is statistically significant.

All told, our effort to approach the causes and cure of changes via the correlates of "change" scores has not been very successful. In a word, the greater number of changes are to be expected the nearer the original Opinionaire score is to chance and the lower the intelligence of the subject. (This holds for the Opinionaire only.)

## BEHAVIOR OF THE ITEMS

Most of our discussion and data up to this point have been presented from the point of view of the persons making the reactions, the number of their changes, and the effects thereof upon the personal score for which the test was designed. From here on we shift our point of view to that of the opinion or other test item to which the subject reacts. Parallel to "change" score and score change and reliability by retest *per person* we will now consider all this *for items*.

## ITEM "CHANGE" SCORE

Whereas, with personal "change" scores ranging from 17 to 81 with a reliability of .785, we concluded that shifts were a function of individuals, we now ask whether these shifts are not also a function of the items themselves. To the opinion "The mother of an illegitimate child should be made to feel society's disapproval" eleven students out of 57 reversed their marking, three to agree and eight to disagree. To the statement that "Criminals should be treated as sick people" eight people changed from disagreement to agreement. For all 200 items of Opinionaire and 125 items of the Inventory we have the data presented in Table 7.

TABLE 7

	Opinionaire	Inventory
Range	2-24	10-44
Mean	11.4 (57 cases)	27.568 (139 cases)
Reliability	.272±.08 (28 <i>vs.</i> 29 cases)	.48±.05 (69 <i>vs.</i> 70 cases)
Corrected for 200 cases	.72±.07	.73±.05

These figures mean, for instance, for the Opinionaire that there was one item on which 24 out of 57 subjects reversed their marking, whereas on another item there were only 2—i.e., 55 out of 57 marked it the same both times. The other 198 items fall between these two extremes, the central tendency being about 11 times per item. If we correlate the number of changes per item made by 28 subjects with the number made by the other 29, we get a coefficient of only .27±.08. This probable error in and of itself makes our further interpretation somewhat uncertain but there are other reasons for believing in the reliability of the item ratings, such as the parallel

finding with the Inventory. Taking the  $r$  of .27 at its face value, the range and reliability of item "change" score here shown argue strongly that changes are a function of and vary with the item as well as with the subject. The items of the Opinionaire showing most and least total change are given in Table 8.

TABLE 8

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<i>Items Showing Greatest Change</i>		
Changes	Item No.	
24	160.	In our zeal to give equal chances to all in our educational system, we have fostered mediocrity in scholarship, in ideals, in personality.
22	178.	Polygamy is a higher form of family relationship than polyandry.
22	51.	The intelligence of minors is affected by excessive smoking.
21	169.	We will never be able to determine scientifically whether, on the whole, petting is conducive to human happiness.
20	133.	There will never be any accurate way of checking up on a person's honesty.
20	63.	The average person needs greater daring more than greater caution.
19	24.	Race prejudice is on the whole beneficial, as it keeps many undesirable foreigners out of the country.
<i>Items Showing Least Change</i>		
5	28.	A lie is sometimes justifiable.
5	34.	Science will never be able to create life.
5	58.	Skirts which do not come as low as the knee should not be worn by grown women.
5	84.	In college, we should be allowed to attend class as much or as little as we please.
5	106.	New-born deformed babies of whose permanent helplessness we can be sure, should be put to death at the outset.
5	137.	White and colored children should not be educated in the same schools.
4	150.	People today are not making the best use of their Sundays when they use them for outings and recreation.
4	198.	There should be exchange shops where women could exchange their old hats, coats, dresses and shoes for used ones which would be new to them.
3	37.	The ministry is a more noble calling than the law.
2	41.	All international disputes should be settled by arbitration.

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Of all 200 items of the Opinionaire the first one in the above list is the one in connection with which the greatest number of stu-

dents contradicted themselves, namely, 24. If we reflect that by chance half of the students, or about 28, would have agreed to the item, it does not appear that our college students have any decided opinion about the scholarship, etc., fostered by our present educational system. At the other end of the scale, however, we find them quite persistent in their view of settling international disputes by arbitration, since only 2 out of 57 students reversed their reaction thereto. When it comes to generalizing about the characteristics of items showing least as contrasted to those showing the greatest change the reader can look for himself and formulate his own generalizations. It seems to the writer that the more constant items are more simple in meaning, more definitely stated, and, interpreting the statistics as well as using *a priori* judgment, they are more in the realm of the students' interests and cover issues which to him are significant. There appears to be a positive correlation between constancy of reaction to and unbalance of an item. The eight items above showing greatest change have an average balance on first taking of 8.2, whereas the 8 of least change have a balance of 12.95. Balance here means proximity to 50-50 division of group into those agreeing and disagreeing. The  $r$  between balance and change per item is  $.34 \pm .04$ . This is parallel to our previously mentioned  $r$  of .51 between personal "change" score and proximity to 100 of the conservatism score of the person. Here again certain factor or factors appear to operate to produce the chance effect in both item "change" score and the 50-50 balance of item, the operation of this factor on both sides being manifested in the  $r$  of  $.34 \pm .04$ . Let us now look at the items of least and greatest change from the Personality Inventory (Table 9). A glance at these two lists indicates that the items of greatest change tend to deal with the more general and the more abstract.

There has been much talk about the mind of the college student as well as about the mind of persons of other groups. Might it not be feasible to get an appreciable amount of human intellectual energy directed toward satisfying our curiosity on this subject by some such method as here indicated? By the retest procedure we might discover not only what percentage believes a thing but how much the persons in this group believe it—stated in terms of constancy or persistence of reaction. To know the force and feeling and opinion on various topics, relatively, may enable us to predict



TABLE 9

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<i>Items Showing Greatest Change</i>		
Changes	Item No.	
44	43.	Do you like to bear responsibilities alone?
42	71.	Do you experience many pleasant or unpleasant moods?
41	11.	Do you try to get your own way even if you have to fight for it?
41	22.	Are you slow in making decisions?
41	123.	Does discipline make you discontented?
40	17.	Are you much affected by the praise or blame of many people?
39	74.	Do you ever upbraid a workman who fails to have your work done on time?
39	110.	Do you usually face your troubles alone without seeking help?
39	23.	Do you think you could become so absorbed in creative work that you would not notice lack of intimate friends?
39	31.	Do you see more fun or humor in things when you are in a group than when alone?
39	38.	Do you find conversation more helpful in formulating your ideas than reading?
<i>Items Showing Least Change</i>		
17	9.	Do you dislike finding your way about in strange places?
17	111.	Have you been the recognized leader (president, captain, chairman) of a group within the last five years?
16	2.	Do you daydream frequently?
16	12.	Do you blush often?
16	15.	Do you usually object when a person steps in front of you in a line of people?
15	19.	Do you frequently argue over prices with tradesmen or junkmen?
13	16.	Have you ever tried to argue or bluff your way past a guard or doorman?
12	92.	Do you ever argue a point with an older person whom you respect?
11	6.	Do you ever give money to beggars?
10	114.	Are you troubled with the idea that people on the street are watching you?

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more accurately the useful content of our intellectual life with our students. To get measures of changes in their convictions and values would seem to constitute, for our own efficiency as college teachers, a measure *par excellence*.

#### ITEM-SCORE CHANGE

We have said that a high percentage of individual person-item reaction contradiction in the retest does not vitally affect the total

score (of the individual) which is taken as the measure of the trait for which the test was designed. However, since in the past questionnaires and opinionaires have been, and are likely to continue to be, designed to take measures of groups of persons on specific items, it is important to know the effect of our numerous individual item changes upon the general group answer to specific items. How far can our questionnaires and opinionaires be trusted to tell us accurately the percentage of mothers who believe in corporal punishment or of men who prefer blondes or of college sophomores who believe in companionate marriage, etc.? Here again we find the total outcome slightly even though appreciably affected by the contradictory item reactions. This becomes clear as we inspect the changes on separate items and the average change for all items.

Let us consider first the subjects' behavior on one or two specific items. On the first taking, 43 out of 57 students agreed to the Opinionaire statement No. 34 that "Science will never be able to create life," and 14 disagreed. On the second taking 3 of the 43 and 2 of the 14 reversed their judgment with the result that on the second taking the item score reads 42 agree and 15 disagree. Four-fifths of the changes balance or neutralize each other on this item, leaving a net change of less than 2%. Responses to item No. 160 of the Opinionaire were least stable as 24 out of 57 students made reversals. The net change on this item, however, was only 3, giving about 5% change in the number agreeing. The average number of reversals per item, as noted in the previous paragraph, is 11.2, whereas the average net change per item is 3.04, which amounts to a percentage change of about 5. The range of net change is from 0 to 12, or 21%. Correlating the percentage of agreements for each item on first taking with the percentage on the second, we get an  $r$  of  $.943 \pm .009$ . This means that the test as a measure of items is highly reliable for the type of student tested.

Using the retest technique to answer the above general question, Bain (1) reports for the questionnaire rather pessimistically. He found for a questionnaire of 61 items applied to 50 college freshmen that nearly one-fourth of all item reactions were changed on the retest. He found that only 2 of the 61 items were not changed by at least one or more persons. To quote, ". . . Even with this liberal interpretation of change, not a single card out of the fifty was unchanged, and the most accurate ones contained at least four

or five changes. If this is true under almost ideal conditions, what must be the 'coefficient of inaccuracy' in the general run of questionnaires?" Our data for both the Opinionaire and the Inventory corroborate Bain far as he goes. For purposes of his study he did not proceed to study the effect of individual changes upon the group answer to the original question. Smith (5) in repeating Bain's experiment and corroborating his conclusions seems to recognize the limitations of the latter's study and indicates that the instability of response varies with the item. He says, "If certain questions do not draw forth consistent responses they must be eliminated from questionnaires unless one is studying individual differences rather than pursuing general conclusions." Smith emphasizes the importance of testing instruments of sociological investigation. If we want to know whether a particular John Smith does or does not wash his teeth regularly the reliability is low, but if we want to know the percentage of a group who report this we can say that our reliability as shown by retest is high.

#### SUMMARY OF DATA

1. Approximately 20% of Opinionaire and Questionnaire reactions are changed on retest.

2. In spite of these changes the retest  $r$  is .94 for the *Social Science Opinionaire* as a measure of general conservatism and from .90 to .92 for the different aspects measured by the *Bernreuter Inventory*.

3. This change phenomenon from one test to the other is in part a function of the persons, showing a range from 7 to 81 ( $31\frac{1}{2}\%$ - $40\frac{1}{2}\%$ ) and reliability coefficient for "change" score of .79 for the Opinionaire and a range of 0 to 61 (0% to 49%) and reliability of .77 for the Inventory.

4. The average amount of change in score per person, however, is only 19% of the number of changes—81% of all changes per person neutralizing each other.

5. The reliability of change in conservatism score is  $.758 \pm .043$ .

6. The odd-even reliability is higher on retest than on first taking.

7. The reliability by change of content and occasion is .85, whereas by either change of content or change of occasion it is about .92, i.e., test of reliability of two forms given on different occasions is more severe than by retest or odd-even, Spearman-Brown.

8. The  $r$  between number of changes per person and proximity of original total score to chance is .51.

9. In spite of 20% reversal in individual-item reactions, the retest  $r$  for conservatism score is .943.

10. This change phenomena from one test to the other is in part a function of items, which show a range of 2 to 24 (3.5% to 42%) and reliability of item "change" score of .72 for the Opinionaire. For the Inventory the range of changes per item is from 10 to 44 (7% to 32%), with a reliability of item change score of .73 (both reliability coefficients on bases of 200 subjects).

### UNANSWERED QUESTIONS

Our chief disappointment in this study relates to our effort to discover the correlates of "change" score.

1. While the data here presented suggests strongly that the explanation for changes is to be found in the lack of knowledge, lack of conviction, or the prevalence of mood, we have not ascertained the extent to which each of these three factors is responsible. We suggest that for a specific test someone correlate separately the change score with another and independent measure of knowledge, of conviction, and of mood.

2. While we have demonstrated that these tests are more reliable for some subjects than for others, we have made scarcely any progress in method for identifying those subjects "of least reliability."

### CONCLUSIONS

1. Changes occur with amazing frequency.

2. This affects appreciably the score of some subjects but on the whole does not greatly destroy the reliability of the test either as a test of persons or of items or issues.

3. These tests are more reliable as a measure of some persons than of others and of some items than of others.

4. This variability of reactions is itself a variable, and the retest appears as a reliable technique for measuring the variability of persons and of items.

5. While a specific reaction of an individual cannot be relied upon, a score obtained by summation or addition of reactions is reliable.

## FORM H

Name \_\_\_\_\_ School \_\_\_\_\_ Year \_\_\_\_\_

Age \_\_\_\_\_ Date \_\_\_\_\_

## SOCIAL SCIENCE OPINIONAIRE

*Instructions:* Here are some statements which have been listed to see what people think about a great many questions. These are all matters of opinion and by the very nature of things each person will agree with some and disagree with others. *If you agree more* than you disagree with a statement, place a plus mark to the left of the number, and if you disagree more than you agree, place a minus mark. Be sure to place either a plus or a minus mark to the left of each number. Work carefully but do not spend too much time on any one statement by splitting hairs or "fussing" over details.

1. The age of six is the logical time to start to school.
2. Curiosity is a more valuable human trait than cleanliness.
3. American leadership needs more patriots.
4. We should be proud of our present schools when we consider the splendid effect they have in building character.
5. The invention of a dicto-writer which will automatically type as one speaks into it, is likely to be made, sooner or later.
6. It is more important to believe in God than to be unselfish.
7. It will never be possible to raise children in an institution as effectively as in a small home.
8. It is possible to invent an ice-cream which could be made merely by opening a tin-can, and exposing the contents to the air.
9. Something more effective than our present brooms, mops and vacuum cleaners should be devised for cleaning our homes.
10. Much more energy should be expended in conserving what mankind does know than in discovering what is not known.
11. Even if it were proved that we need more sunshine, it would not be wise for university students to wear sun-suits on the campus in summer time.
12. Church attendance is a fairly accurate measure of the spirituality of an individual.
13. The proposal to change the present calendar to one having 13 months of 28 days is sound.
14. Russian revolutionists are no more primitive than French Revolutionists.
15. At the age of 21, people should have the privilege of changing their given names.
16. The mind and spirit of man have not kept pace with the rapid change in his material environment.
17. Any science which conflicts with religious beliefs should be taught cautiously, if at all, in our schools.
18. The medical profession should be socialized to the extent that medical aid at state expense be provided for all children.
19. Married women should not be allowed to teach in public schools.
20. If there is a conflict between one's parents and one's conscience, one should obey one's parents until of age.
21. Suicide is never justifiable.



22. Radical agitators and propagandists should be allowed to speak publicly in parks and streets.
23. If the lower 25% of the population could be encouraged to have no children, the average of the human race would rise rapidly.
24. Race prejudice is on the whole beneficial, as it keeps many undesirable foreigners out of the country.
25. Criminals retard our moral progress more than all other people combined.
26. As long as our captains of industry are as humane to their employees and as long as wealthy people are as philanthropic as at present, there will be no need for socialism.
27. National patriotism should be second to world patriotism.
28. A lie is sometimes justifiable.
29. College or university professors should not put forth their own radical views in the classroom.
30. Taxation should be used to mitigate economic inequalities and to secure the greater socialization of wealth.
31. The continental attitude toward mistresses is less sane than ours.
32. The United States Navy should be large and up-to-date, second to none.
33. A woman's place is in the home, and not in the business or professional world.
34. Science will never be able to create life.
35. Criminals should be treated as sick people.
36. Industries in the United States should be controlled by the men who work in them.
37. The ministry is a more noble calling than the law.
38. Trial by jury has been, and always will be the most effective way of securing justice.
39. It is bad for a married man to take another man's wife to the movies.
40. We will always need the present two-party system of politics in America.
41. All international disputes should be settled by arbitration.
42. Armistice Day should be celebrated with less martial spirit.
43. The American churches were wrong in supporting the last war.
44. Most men should wear neckties.
45. Conservative people are usually more intelligent than radical people.
46. Three meals a day will always be the best general rule.
47. Little boys should not have soldier suits, tin soldiers or toy guns or cannon for playthings.
48. It would not be desirable to have a Chinese family move in next door.
49. The metric system of weights and measures should be adopted instead of our present system.
50. A commission form of government for the conduct of our national affairs would be desirable.
51. The intelligence of minors is affected by excessive smoking.
52. Complete naval and military disarmament would be treason.
53. Since the theory of evolution has been accepted by most scientists, it should be taught in our schools.
54. Our spelling should be revised and simplified.
55. Democracy as practiced in the United States is the best of all the modern governments, because it is most suited to the needs of modern times.
56. Turkish people should not be admitted to our country as citizens.

57. Even in an ideal world, there should be protective tariffs.
58. Skirts which do not come as low as the knee should not be worn by grown women.
59. Modern fiction should be required to pass a board of censors before publication.
60. The Bible is valuable primarily because it contains some of the world's best literature, not because it is the Word of God.
61. "My country, may she always be right, but my country, right or wrong," is a good slogan.
62. Children should be brought up to have high respect for our ancestors.
63. The average person needs greater daring more than greater caution.
64. We cannot say whether Christianity is sound or not, because we have never practiced it systematically.
65. The Civil War could have been and should have been avoided.
66. The world needs a new religion.
67. It is probable that wood will some day be converted into humanly edible food.
68. A man should be a booster for his city, to help it grow bigger.
69. Companionate marriage or some similar solution must be found for our modern marriage situation.
70. We should celebrate Pasteur's birthday rather than Washington's, as he has done the world a greater service.
71. When human babies are produced ecto-genetically, the evolution of the race will be accelerated.
72. Nursery schools should be available for nearly all children between the ages of two and four.
73. Telling a lie is worse than taking the name of God in vain.
74. Community kitchens would be bad, in that they would destroy home life.
75. The effect of motion pictures upon the character of people who see them is known.
76. Freedom of teaching, that is, allowing the teachers to teach what they think is the truth, is necessary for real education.
77. Preaching is one of the most effective ways of teaching people to lead better lives.
78. We owe our progress to the radically minded people, rather than to the "middle of the road" folk.
79. Truly great women will always be far less frequent than truly great men.
80. Football helps put a college on the map, and should be heartily supported by the alumni.
81. For ordinary occasions paper plates should be used to save the labor of washing dishes.
82. English is the only language likely to be in universal use in some future day.
83. Radical foreigners who wish to visit the United States should be admitted.
84. In college, we should be allowed to attend class as much or as little as we please.
85. If Russia demonstrates that Communism is better than Capitalism, we should accept the former.
86. Not the young men but the old men should fight our wars.
87. Our courts should be in the hands of sociologists rather than lawyers.
88. The American custom of autos keeping to the right is more logical than the English custom of keeping to the left.

89. Eugenics would be a greater aid to social development than education.
90. Man can never exist without religion.
91. Women should have as much right to propose dates to men, as men to women.
92. The presidential tenure of office of four years is not as it should be.
93. Historic heroes should be "debunked."
94. One is never justified in taking another's life, even when it would be a merciful act.
95. The best way to remedy the modern divorce situation would be to make the conditions of divorce more stringent, so that marriage would be considered in a more serious light.
96. People who are religious will be no happier in the future life than will others.
97. It is more undesirable for women to smoke cigarettes than for men.
98. Generally speaking, Americans are no more intelligent and enterprising than people of most any other country.
99. There should be a definite and appreciable amount of compulsory military training.
100. Poetry of bygone days is of less worth to our time than modern poetry.

## FORM I

Name \_\_\_\_\_ School \_\_\_\_\_ Year \_\_\_\_\_

Age \_\_\_\_\_ Date \_\_\_\_\_

## SOCIAL SCIENCE OPINIONAIRE

*Instructions:* Here are some statements which have been listed to see what people think about a great many questions. These are all matters of opinion and by the very nature of things, each person will agree with some and disagree with others. *If you agree more* than you disagree with a statement, place a plus mark to the left of the number, and if you disagree more than you agree, place a minus mark to the left of the number. Work carefully but do not spend too much time on any one statement by splitting hairs or lingering over details.

1. The present tendency among women to wear less clothing should be encouraged, especially in warm weather and climates.
2. Workers in industry should receive a part of the profits of their company in addition to their regular salary.
3. College education would profit by a 50% reduction of class work and a corresponding increase of work outside of class.
4. Religious missionaries have rendered the world a great social service.
5. Scientific method will never benefit us through education, as much as through medicine, communication, etc.
6. New-born deformed babies of whose permanent helplessness we can be sure, should be put to death at the outset.
7. Conscience is an infallible guide.
8. College students should expect to be rather specifically guided in their reading by their instructors.
9. National boundaries may some day become as truly obliterated as state lines have become in America during the past 150 years.

10. Socially minded experts rather than voters should decide the policies of government.
11. Moral stability will not be regained until the home once more begins to count as a social institution.
12. Free trade is economically unsound.
13. Aristocracies of worth should replace those of wealth or birth.
14. Women should be allowed to keep their maiden names after marriage.
15. Most members of the D. A. R. would repudiate as dangerous characters modern personalities equivalent to the progenitors through whom they claim membership in the organization.
16. Women in general are not as intelligent as men.
17. Games of chance are ethically wrong.
18. We should change our minds and policies progressively and constantly.
19. Our national government should appropriate for the next twelve years at least 20 billion dollars for research (chiefly in the social sciences of psychology, education, sociology, politics and government).
20. Our universities should have as many research workers as teachers.
21. All children should have some sectarian religious training either on Sundays or week days.
22. All oil beneath the earth's surface should be the common property of all men, and he who pumps it out should pay royalty to society as a whole and not to any one man or group of men.
23. War movies should be abolished.
24. Most great men come from poor families.
25. Our present system of law, based upon outgrown conditions, should be replaced by a progressive system based upon the conditions of our present order.
26. The churches which oppose modern social dancing are right in doing so.
27. We are not likely to discover anything about our planet as important as the discovery that it is round.
28. A production of Hamlet in modern dress can never take the place of the costumed performance.
29. The maritime custom of a captain's being the last to leave his ship is outmoded, sentimental, and unnecessary.
30. If the Supreme Court finds a law unconstitutional, its decision should be accepted as final by the people.
31. Matters of dispute between persons should be settled by due process of law, rather than by arbitration.
32. The number of legal grounds for divorce should be reduced.
33. There will never be any accurate way of checking up on a person's honesty.
34. Capital punishment will some day be done away with.
35. Cremation is the best method of burial.
36. In an economically effective society it should be neither necessary nor desirable for women to do much work outside the home.
37. White and colored children should not be educated in the same schools.
38. We should make our immigration restrictions with regard to the desirability of an individual, regardless of his nationality, and abolish the practice of a fixed national quota.
39. Private and personal gain will always be essential for ideal human motivation.



40. Our universities and colleges would do well to abolish all other marks and merely record passing and failing.
41. The Philippine Islands should have been granted their independence as early as 1918.
42. The Government should own the water power sites and distribute the power.
43. Our present system of athletics in America is at fault in that it does not provide for mass participation.
44. College students should obey their parents, even when they think their parents are wrong.
45. We cannot hope for much from gland psychology (changing our personality by feeding gland extract, transplanting glands, etc.)
46. As we have art museums free and open to the public, so should we have many free musical concerts and operas supported out of public taxation.
47. Denominationalism is a curse to religion.
48. Honorary societies such as Phi Beta Kappa do not do enough good to society at large to justify their existence.
49. Church hymns should be revised to fit modern discovery.
50. People today are not making the best use of their Sundays when they use them for outings and recreation.
51. The three R's do not constitute the major portion of our total educational opportunity and obligation.
52. Science should endeavor to discover a harmless liquor retaining almost all the good features but lacking the harmful features of alcoholic beverages.
53. No individual, even though he feels that life is not worth living, is justified in committing suicide.
54. The Japanese race is, on the whole, crafty and treacherous.
55. Aeroplanes will never be as numerous as automobiles.
56. Religion today, based on a certain amount of authority and outworn creed, is retarding progress.
57. America has attained the highest level of living in the history of the human race.
58. If fraternities and sororities are permitted in college, there should be enough to give every one an opportunity to join.
59. A new marriage code should be drawn up in the United States whereby the wife is not only given a right in the common property, but is made jointly responsible for the support of the family.
60. In our zeal to give equal chances to all in our educational system, we have fostered mediocrity in scholarship, in ideals, in personality.
61. Any kind of a home is better than no home at all.
62. Whenever convenient, one should avoid dealing with a chain store.
63. People should go barefoot more in order to have healthier feet.
64. We have too much advertising in the world at present.
65. You cannot make a silk purse out of a sow's ear.
66. Well-trained elementary teachers should receive the same salary as well-trained high school teachers, if not more.
67. Idiots should be allowed to continue to live and to get whatever happiness they possibly can.
68. Race prejudice is useful in that it prevents intermarrying.
69. We will never be able to determine scientifically whether, on the whole, petting is conducive to human happiness.
70. As the majority of high school boys smoke, a smoking room should be provided for them.



71. Tipping waiters and porters is not a desirable custom.
72. Sunday school teachers should be paid as much as day school teachers, proportionately to time spent and benefit to pupil.
73. Military and naval preparedness is essential in the policy of the United States.
74. There is no probability that the artificial production of milk or milk substitute will do away with the cow.
75. The man who is more like his fellows is, on the whole, more valuable to society than the man who is a law unto himself.
76. Ministers should preach more about immortality than about social justice.
77. Military training should continue to receive strong support in our universities.
78. Polygamy is a higher form of family relationship than polyandry.
79. The chivalry of women to men and of men to weaker (less intelligent, less informed) men is about as essential as the chivalry of men to women.
80. Service is a higher ideal than efficiency.
81. Sex instruction in high school should not be given in mixed groups.
82. The increased economic independence of women is not a good movement.
83. The A.B. degree should continue to require four and only four years of work above the high school.
84. Husbands and wives should have frequent vacations from each other of several days or even weeks.
85. Almost all forms of athletics good for men are good for women.
86. Criminals are born, not made.
87. The English and the Americans have the highest standards of morality.
88. "Whatever a man soweth, that shall he also reap."
89. The value of a college degree is usually over-rated.
90. It was not within the power of the diplomats of 1900 to 1912 to prevent the World War.
91. The mother of an illegitimate child should be made to feel society's disapproval.
92. The state should not support researches which have no immediate practical value.
93. One-fifth of the public school budget could well be spent on educating the parent to educate the child.
94. The government should own the railroads, even if it doesn't operate them.
95. Classical literature is of less importance to students than the literary movements of their own day.
96. Economically and aesthetically, our tastes are too extravagant.
97. Children should have more voice in the direction of family affairs.
98. There should be exchange shops where women could exchange their old hats, coats, dresses and shoes for used ones which would be new to them.
99. Censorship of speech, press and entertainment should be completely abolished.
100. The wisest people conform most closely to social convention.

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LA CONSTANCE DE LA TECHNIQUE DE L'OPINIONNAIRE  
 ETUDIÉE INTENSIVEMENT AU MOYEN DES TESTS RÉPÉTÉS  
 (Résumé)

Un groupe d'étudiants universitaires a subi pour la seconde fois l'Opinionnaire de Lentz pour la mesure du conservatisme et l'Inventaire de la Personnalité de Bernreuter.

Vingt pour cent de toutes les réactions des tests ont été renversées dans la répétition. Quatre-vingts pour cent de celles-ci se balancent et donc n'influent pas sur le résultat final pour le sujet ou pour la partie du test. Les corrélations pour les résultats totaux personnels entre la première épreuve et la seconde ont été pour l'opinionnaire de 0,94 et pour l'inventaire de 0,92, 0,91, 0,90, et 0,915 dans ses divers aspects. Comme mesure de l'opinion des parties individuelles des tests pour chaque groupe le second test donne une corrélation de 0,943 pour l'opinionnaire.

Le changement des réactions aux parties des tests se montre une fonction des personnes qui subissent le test ainsi que celle des parties auxquelles elles réagissent. La variabilité des personnes est mesurée par le résultat du "changement," lequel montre une constance de 0,79. La variabilité des parties dans leur tendance à montrer des changements est mesurée par le résultat des changements des parties, lequel montre une constance de 0,72. Ces données pour l'opinionnaire ressemblent beaucoup aux données de l'inventaire et sont corroborées par celles-ci.

LENTZ

DIE ZUVERLÄSSIGKEIT DER MEINUNGSBOGEN-METHODE  
 DURCH DIE NACHPRÜFUNGSMETHODE INTENSIV  
 UNTERSUCHT

(Referat)

Der Lenz-Meinungsbogen zur Messung von Konservatismus und das Bernreuter "Personality Inventory" wurden einer Gruppe Studenten zum zweiten Mal gegeben.

Zwanzig Prozent aller Reaktionen wurden das zweite Mal umgekehrt. Achtzig Prozent von diesen Reaktionen gleichen sich aus und haben deswegen keinen Einfluss auf den endgültigen Wert für die Vp. oder auf die verschiedenen Testsachen. Die Korrelation für den ganzen Test zwischen dem ersten und zweiten Mal war für den Meinungsbogen ,94 und für das "Inventory" ,92, ,91, ,90, und ,915 in den verschiedenen Teilen. Als Messung der individuellen Meinung pro Gruppe korreliert der zweite Test mit dem ersten ,943 für den Meinungsbogen.

Die Veränderung der Antworten auf die Fragen wird sowohl als eine Funktion der Vpn., die die Prüfung machen, als auch der Fragen, auf die sie reagieren, nachgewiesen. Die Veränderlichkeit der Fragen bei der Neigung, Änderungen zu zeigen, wird durch den "Veränderungswert" gemessen, der eine Zuverlässigkeit von ,72 zeigt. Die vorhergehenden Daten für den Meinungsbogen sind gleichlaufend mit und bestätigt durch die "Inventory" Daten.

LENTZ

# ATTITUDES OF 4430 EMPLOYEES\*<sup>1</sup>

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RICHARD STEPHEN UHRBROCK

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## I. INTRODUCTION

Employee attitudes are expressed in all degrees from wholehearted cooperation to sabotage and strikes. The problem of evaluating and modifying attitudes will receive more and more attention by American employers as the machinery of the National Industrial Recovery Act works to introduce employee representation into industries that have not hitherto provided the means for workers to express their views as to management.<sup>2</sup>

Workers have three basic fears: fear of losing the job; fear of loss of earning power through illness or accident; and fear of a penniless old age. An industrial organization may alleviate these fears by guaranteeing steady employment, paying good wages, providing pensions and sick and death benefits, operating hospitals and cafeterias, and distributing a share of the profits to employees. Nevertheless, unfavorable attitudes may result from ignorance of the plans and policies of the organization which the management has assumed are understood by the workers. The low level of intelligence of some groups explains the ignorance which has fostered misunderstanding. Poor supervision and leadership must assume part of the blame, while the survival of policies no longer in key with the working set-up may be at the base of other poor impressions of the management.

## II. THE PROBLEM

It becomes important to ask: "What is the attitude of employees toward the company's policies and practices?" and "What can be done to remove points of irritation and improve attitude?" Five methods whereby employee attitudes may be gauged are recognized

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<sup>1</sup>Paper read before the American Psychological Association, Chicago, September 13, 1933.

<sup>2</sup>United States Congress. H. R. 5755. (Industrial Recovery Act.) June 13, 1933. Sec. 7.

by Kornhauser (4): (*a*) the "impressionistic" method as illustrated by the work of Whiting Williams (16-21), (*b*) the unguided interview associated with the names of Pennock (9), Putnam (10), and Elton Mayo (7, 8), and the Western Electric Company experiment, (*c*) the guided interview employed by Kornhauser and Sharp (5) in the Kimberly-Clark Corporation study, (*d*) the question-blank method developed by J. David Houser and his associates (2, 3), (*e*) attitude measurement scales which are the special contribution of L. L. Thurstone (12-15).

In a study of attitudes of foremen, clerical employees, and factory workers, conducted in a large manufacturing organization in January, 1933, it was decided to search for answers to questions about employees' opinions of the company by using an attitude scale. The necessary scale was constructed for the purpose of this study.

### III. SCALE CONSTRUCTION

In order to construct a scale to measure the attitudes of individual employees 279 single-sentence statements were prepared by research workers on the company's staff. These statements were phrased in the language of the workmen, or were specially written to express varying shades of attitude toward the company policies and practices. Several statements ranging from extremely laudatory to markedly unfavorable were made about each policy.

Thirty college professors<sup>3</sup> in academic centers in various sections

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<sup>3</sup>I am indebted to the following persons for assistance in obtaining graduate students to serve as judges and sort the 279 statements which were used in constructing the attitude scale used in this study: Dr. P. S. Achilles, Psychological Corporation; Dr. G. W. Allport, Harvard University; Dr. L. D. Anderson, Western Reserve University; Dr. H. G. Bishop, Wittenberg College; Professor R. D. Bundy, Cleveland College; Dr. H. E. Burtt, Ohio State University; Dr. W. Chase, Dartmouth College; the late Dr. J. E. Downey, University of Wyoming; Dr. J. E. Evans, Iowa State College; Dr. F. S. Freeman, Cornell University; Dr. A. R. Gilliland, Northwestern University; Dr. R. H. Gundlach, University of Washington; Dr. O. M. Hall, Personnel Research Federation; Dr. L. D. Hartson, Oberlin College; Dr. J. G. Jenkins, Cornell University; Dr. H. D. Kitson, Columbia University; Dr. A. W. Kornhauser, University of Chicago; Dr. M. A. May, Yale University; Dr. H. Meltzer, Washington University; Dr. B. V. Moore, Pennsylvania State College; Dr. H. Moore, Mount Holyoke College; Professor R. M. Page, University of New Mexico; Professor D. G. Paterson, University of Minnesota; Dr. R. Pintner, Columbia University; Dr. A. T. Poffenberger, Columbia University; Dr. H. H. Remmers, Purdue University; Dr. D. W. Seago, Newcomb College, Tulane University; Dean C. E. Seashore, University of Iowa; Dr. E. K. Strong, Jr., Stanford University; Dr. A. L. Winsor, Cornell University.



of the United States cooperated in this study by asking graduate students in psychology to sort the 279 attitude statements into eleven piles by the method of equal-appearing intervals, according to degree of favorableness, so that a scale value could be computed for each item.

The correlation between scale values computed on the basis of the data contributed by the first and second groups of fifty judges was  $+.990 \pm .0007$ . At the request of Professor A. T. Poffenberger, of Columbia University, fifty sets of attitude statements were made available for the use of a graduate student (1) who was working for a master's degree in psychology. The correlation between the scale values computed for her fifty judges and our first set of fifty was  $+.984 \pm .001$ . The correlation with our second set of fifty was  $+.986 \pm .001$ .

An item was retained for further consideration when 40 out of 50 of the judges placed it in three contiguous classifications. (There were 220 such items.) For those scale values for which there were several items, that item was selected which showed the greatest concentration of judgments. The fifty statements finally selected dealt with the various policies of the company and were spaced at intervals of 0.1, 0.2, or 0.3 on a scale ranging from 0.6 to 10.5.

The following statements are presented to illustrate the kinds of statements that were retained in the final attitude scale, which was composed of fifty items.

### *Attitude Statement*

#### *Scale value*

- 10.4 I think this company treats its employees better than any other company does.
- 9.5 If I had to do it over again I'd still work for this company.
- 9.3 They don't play favorites in this company.
- 8.9 A man can get ahead in this company if he tries.
- 8.7 I have as much confidence in the company physician as I do in my own doctor.
- 8.5 The company is sincere in wanting to know what its employees think about it.
- 7.9 A wage incentive plan offers a just reward for the faster worker.
- 7.4 On the whole the company treats us about as well as we deserve.
- 6.3 I think a man should go to the hospital for even a scratch as it may stop blood poisoning.
- 5.4 I believe accidents will happen no matter what you do about them.
- 5.1 The workers put as much over on the company as the company puts over on them.
- 4.4 The company does too much welfare work.

- 4.1 Soldiering on the job is increasing.
- 3.6 I do not think applicants for employment are treated courteously.
- 3.2 I believe many good suggestions are killed by the bosses.
- 2.9 My boss gives all the breaks to his lodge and church friends.
- 2.5 I think the company goes outside to fill good jobs instead of promoting men who are here.
- 2.1 You've got to have "pull" with certain people around here to get ahead.
- 1.5 In the long run this company will "put it over" on you.
- 1.0 The pay in this company is terrible.
- 0.8 An honest man fails in this company.

#### IV. GATHERING THE DATA

Attitude statements were checked by 3934 factory employees, 96 clerical workers, and 400 foremen. The factory employees were workers who tended machines, filled cartons, repaired and maintained equipment, stacked products in warehouses, and performed other skilled and unskilled work. The average age of the group was approximately 34 years. The average education was perhaps sixth grade. The clerical workers were typists, stenographers, secretaries, cost clerks, and filing clerks. The average clerk in the group had three years' high-school education and was about 28 years of age. The foremen supervised approximately ten men each. The average age of the foremen was 37 years. About 10 per cent were college graduates. The remaining foremen had, on the average, one year of high-school training.

Factory superintendents were responsible for giving the tests. Arrangements were made for all tests to be given during the course of a single day. Consequently test groups varying in size from 25 men to 100 men were assembled in the various factories at different times ranging from seven o'clock in the morning until seven in the evening. Approximately three-quarters of an hour was allotted to each group. The booklet itself provided for the anonymity of the worker filling out the form, but check marks were requested as to sex and length of service with the company (under six years or over six years).

After the men were assembled the superintendent explained that the employees in all of the factories of the company were meeting to fill out the printed forms such as had been placed before them. He stated that the management wanted to know their frank opinions about a number of the company plans and policies. *He emphasized the fact that they were not to sign their names to the blanks.* No

attempt would be made to find out who filled out any paper. The men were asked to be sincere and honest in their expressions of opinion.

A box or carton, arranged with a slit in the top like a ballot box, was placed at one side of the room for the men to deposit the booklets when they had completed marking them. No one stood near the box. Every effort was made to make the men feel that their identity would not be disclosed no matter how they checked the statements.

## V. RESULTS

In order to determine the reliability of the attitude scores, two scores were computed for each of 477 workmen. One score was the average scale value of all odd-numbered attitude statements checked as true and the other was the average scale value of all even-numbered statements so checked. The odd-even reliability was  $+.803 \pm .011$ . Hence, by the Spearman-Brown prophecy formula, the reliability of the complete list of 50 statements is estimated to be  $+.891 \pm .007$ .<sup>4</sup>

The test booklets for the 96 clerical workers contained three parts: (a) 60 company information items, (b) 50 attitude statements, and (c) Otis Self-Administering Test of Mental Ability, Higher Examination, Form A, which contains 75 items with a time limit of 30 minutes. These parts were stapled together so that the relationship between the three variables could be studied, although no names were signed to the blanks.

The correlation between attitude score and knowledge of company information was  $-.01 \pm .07$ . The correlation between attitude score and Otis Test score was  $-.14 \pm .07$ . This is in accord with the finding of Likert (6), who reported the absence of significant relationship between measures of attitude and intelligence. The correlation between knowledge of company information and Otis Test score was  $+.15 \pm .07$ .

No intelligence test was given to factory workers or foremen. The mean scores on the attitude test for the twelve factories are shown in Table 1.

The difference in mean scores for the worker groups between Factory A (6.76) and Factory B (6.47) is statistically significant.

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<sup>4</sup>Using the formula for  $PE_{r_{11}}$  derived by Eugene Shen (11).

TABLE 1  
 FACTORIES COMPARED BY ATTITUDE SCORES

Factory	Workers		Foremen	
	Number	Mean	Number	Mean
A	87	6.76	15	7.59
B	342	6.47	25	7.29
C	197	6.39	45	7.07
D	136	6.38	16	7.46
E	341	6.37	31	6.87
F	892	6.36	86	7.45
G	200	6.35	28	7.21
H	236	6.34	21	7.38
I	171	6.31	19	6.89
J	1034	6.30	74	7.18
K	121	6.03	11	6.49
L	177	5.97	29	6.84
All factories	3934	6.34	400	7.19

The critical ratio is 2.6. Likewise, the difference between mean scores for the worker groups in Factory J (6.30) and Factory L (5.97) is significant (critical ratio equals 3.9).

In every factory the mean score of the foremen on the attitude scale was higher than that of the workers.

Data were gathered in two factories bearing upon the question of the effect of time of testing upon the mean attitude scores. The mean score for the 1127 persons tested at hourly intervals from 7:00 A.M. to 11:30 A.M. was 6.35. The mean score for the 590 persons tested from 2:00 P.M. to 7:30 P.M. was 6.36. The critical ratio is 0.3, which is not significant.

Table 2 shows the number of cases, means, standard deviations, and standard errors of means for the various service classifications considered in this study. The "non-determinants" represented a group of 646 persons who failed to indicate either sex or length of service or both on the attitude booklet. Their mean score on the attitude test was 6.32 as compared with 6.30 for the male factory workers. Although the "non-determinants" were careless, or cautious, in omitting to indicate sex or length of service or both on the attitude booklet from the point of view of mean score and variability of the scores they can be considered a typical group of employees, so far as attitude is concerned.

A total of 1433 male and female factory workers had been em-

TABLE 2  
SERVICE CLASSIFICATIONS COMPARED BY ATTITUDE SCORES

	More than six years' service			Less than six years' service			Total		
	N	M	$\sigma$	N	M	$\sigma$	N	M	$\sigma$
Men factory workers	1302	6.35	0.98	1576	6.26	1.03	2878	6.30	1.01
Women factory workers	131	6.69	1.16	279	6.59	0.96	410	6.62	1.02
Non-determinants	....	....	....	....	....	....	646	6.32	1.02
All factory workers	1433	6.38	1.00	1855	6.31	1.02	3934	6.34	1.02
Clerks	....	....	....	....	....	....	96	6.89	0.69
Foremen	....	....	....	....	....	....	400	7.19	0.76



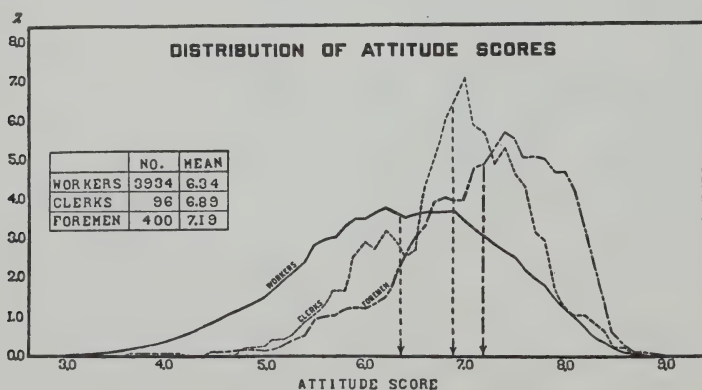
ployed by the company for more than six years. The mean score on the attitude test for this group was 6.38. A total of 1855 persons had been employed fewer than six years. Their mean score was 6.31. The difference is not great, but it is probably significant, since the critical ratio is 1.9.

The mean scale value of all attitude statements checked by the 2878 men was 6.30, while the mean scale value for the 410 women was 6.62. The critical ratio is 6.0 and is definitely significant. The tendency of the women to be more favorably disposed toward the company than were the men was noted in 11 of the 12 factories.

Statements expressing a more favorable attitude toward the company were checked by more than twice as many workers as checked the unfavorable statements.

There are significant differences in the mean scores on the attitude scale for the three main classifications of employees: (a) factory workers, (b) clerks, (c) foremen. The critical ratio for the difference between the means for factory workers and clerks is 7.58. When we compare mean scores for factory workers and foremen we find a critical ratio of 20.7. In the case of clerks and foremen the critical ratio is 3.77.

These differences may be expressed in still another way. The scores of 77 per cent of the clerks exceeded the mean of the factory workers. The scores of 86 per cent of the foremen exceeded the mean of the factory workers. The scores of 70 per cent of the foremen exceeded the mean of the clerks.



## VI. DISCUSSION

General attitude toward the company as a whole may be considered as a blend of many specific attitudes that have resulted from various types of experiences. The new employee, even before he applies to the company for work, has an "attitude" toward the organization. This attitude has been built up incidentally through conversation and reading, and reflects, more or less accurately, the company's reputation with the general public, or, at least, with that portion with which he has been associated. As the applicant goes through the Employment Department, the Medical Examiner's Office, and meets his prospective foreman, each contact has attitude-creating possibilities. He is favorably or unfavorably impressed.

The fellow workers and the general working conditions in the department where the man begins work all contribute experiences that help to develop his attitudes. The cafeteria and all the practices and policies of the company that control the behavior of the new-comer likewise do their share in molding the attitudes of the new employee. The attitude of each worker toward the company is a fluctuating thing like the mercury in a thermometer. A succession of favorable experiences helps to create a loyal, cooperative attitude. Points of friction and misunderstanding tear down morale.

The tendency of employees to check favorable statements more frequently than unfavorable statements indicates a wholesome attitude toward the company. For example, the item "If I had to do it over again, I'd still work for this company" was checked by 96.0 per cent of the foremen, 94.8 per cent of the clerks, and 82.0 per cent of the factory employees. "They don't give a man a chance to get ahead in this company" was checked by 8.25 per cent of the foremen, 12.4 per cent of the clerks, and 26.5 per cent of the factory workers. It is evident in this study that employees will accept the word of the management that candid expressions of belief are desired.

The reasons for the significant differences in the reactions of factory employees, clerical workers, and foremen are not self-evident. The three groups have been drawn from the same communities. The clerks are in a sense the "white collar" brothers and sisters of the factory employees and foremen. The foremen have, in the majority of cases, emerged from the factory worker group. It is possible that a selective attitude factor operated in the appointment

of the foremen from the ranks in that it is the tendency in any company to promote workers who have demonstrated a cooperative attitude rather than those who are antagonistic. The clerks who are more favorably disposed toward the company than the factory employees enjoy better working conditions. They also have certain holidays and vacations with pay, which is not true in the case of hourly rate factory employees. The clerks are more closely and personally associated with the superintendents and managers of the company than are the factory workers. Many clerks see the stages in the development of plans and policies that will affect all of the employees when put into operation. The favorable attitude of the foremen may be due, to some extent, to the fact that they function as interpreters of the company's plans and policies to the workers. Here, again, an appreciation of the reasons lying in back of a change in procedure may aid in creating favorable attitude. All of these reasons for differences in attitude in the groups of foremen, clerks, and factory workers may be superfluous. The real reason for such differences as have been demonstrated in this study may be due to the fact that foremen are paid more than clerks, and clerks are paid more than factory workers.

Attitude toward the company can be created and modified by employers. Effective employee representation plans and well-organized industrial training programs may become instruments in eradicating antagonistic attitudes and fostering healthful industrial relations. If carefully planned studies of employees' attitudes are made from time to time, employers should be able to gauge their progress in eliminating points of irritation in the work situation. By means of the attitude measurement technique workers may safely express their opinions about working conditions, pay, and hours. Employers, on the other hand, may keep themselves informed of changes in workers' attitudes and modify company practices so as to insure mutual harmony and good-will.

## VII. SUMMARY

1. By means of a specially constructed scale the attitudes of 96 clerks, 400 foremen, and 3934 factory workers were measured.

2. The odd-even reliability of the scale was  $+.803 \pm .011$ . The estimated reliability by the Spearman-Brown prophecy formula was  $+.891 \pm .007$ .

3. The correlation between attitude score and knowledge of company information was  $-.01 \pm .07$ .

4. The correlation between attitude score and Otis Test score was  $-.14 \pm .07$ .

5. The correlation between knowledge of company information and Otis Test score was  $+.15 \pm .07$ .

6. The mean scores on the attitude test, for the three groups studied, were as follows: foremen 7.19, clerks 6.89, factory workers 6.34. These differences are significant.

7. In each of twelve factories, widely scattered geographically, the mean scores of foremen on the attitude scale were higher than the mean scores of workers.

8. The 1433 employees with more than six years' service were slightly more favorably disposed toward the company than the 1855 employees with fewer years of service. The means were 6.38 and 6.31, and the critical ratio was 1.9.

9. The mean scale value of all attitude statements checked by the 2878 men was 6.30 while the mean scale value for the 410 women was 6.62. The critical ratio is 6.0 and is definitely significant.

10. The mean score for 1127 persons tested at hourly intervals between 7:00 A.M. and 11:30 A.M. was 6.35. The mean score for 590 persons tested from 2:00 P.M. to 7:30 P.M. was 6.36. The critical ratio, 0.3, is not significant.

11. Statements expressing a more favorable attitude toward the company were checked by more than twice as many workers as checked the unfavorable statements.

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### LES ATTITUDES DE 4,430 EMPLOYES

#### (Résumé)

Pendant plusieurs années une grande organisation industrielle a payé des gages élevés, a garanti aux employés le travail pendant quarante-huit semaines par an, a fourni des pensions et l'assurance contre la maladie et la mort, a établi des restaurants et des hôpitaux, et a distribué une part des bénéfices aux employés. On a fait une étude dans le but de répondre à la question, "Quelle est l'attitude des employés à l'égard des plans et des méthodes d'exécution de la compagnie?" Un test contenant cinquante expressions d'attitude mises en échelle a été subi par 96 commis, 400 chefs d'atelier, et 3934 ouvriers. La constance de l'échelle (formule Spearman-Brown) a été de  $+0,891 \pm 0,007$ . La corrélation entre l'attitude et l'intelligence générale a été de  $-0,14 \pm 0,07$ . Les résultats moyens du test sur l'attitude ont été: chefs d'atelier, de 7,19, commis, de 6,89, ouvriers, de 6,34. Ces différences sont significantes. Dans chacune de douze usines, très dispersées géographiquement, les résultats moyens des chefs d'atelier ont été plus élevés que ceux des ouvriers. Le résultat moyen des femmes a été plus élevé que celui des hommes (6,62 et 6,30). Les employés qui ont travaillé plus de six ans ont été plus favorablement disposés à l'égard de la



compagnie que ceux qui ont travaillé moins de temps. Les expressions d'une attitude favorable à l'égard de la compagnie ont été marquées par plus de deux fois le nombre des ouvriers qui ont marqué les expressions défavorables. Les employés n'ont signé aucuns tests.

UHRBROCK

# ATTITÜDEN VON 4430 ANGESTELLTEN

(Referat)

Seit vielen Jahren hat eine grosse Gewerbeorganisation gute Löhne bezahlt, den Angestellten achtundvierzig Wochen Arbeit im Jahre garantiert, sie mit einer Rente und mit Kranken- und Totenwohltätigkeiten versorgt, Speisehäuser und Krankenhäuser verwaltet, und einen Anteil der Erträge unter die Angestellten verteilt. Eine Untersuchung wurde vorgenommen, um die Frage zu beantworten: "Wie sind die Angestellten auf dieses Verfahren der Gesellschaft eingestellt?" Ein Test, der aus fünfzig Attitüdenangaben bestand, wurde 96 Buchhaltern, 400 Aufsehern, und 3934 Fabrikarbeitern gegeben. Die Zuverlässigkeit der Skala (Spearman-Brown Formel) war  $+0.891 \pm 0.007$ . Die Korrelation zwischen Attitüde und genereller Intelligenz war  $-0.14 \pm 0.07$ . Die Durchschnittswerte für den Attitüdentest waren: Aufseher 7.19, Buchhalter 6.89, Fabrikarbeiter 6.34. Diese Unterschiede sind Bedeutsam. In jeder der zwölf Fabriken, die geographisch weit verbreitet waren, waren die Durchschnittswerte für die Aufseher höher als die Durchschnittswerte für die Arbeiter. Der Durchschnittswert für die Frauen war höher als der für die Männer (6.62 und 6.30). Angestellte mit mehr als sechs Jahren Dienst waren günstiger gestimmt gegen die Gesellschaft als diejenigen mit weniger Dienst. Die Angaben, welche eine günstige Attitüde gegen die Gesellschaft ausdrückten, wurden von mehr als zweimal so vielen Arbeitern unterstrichen als die ungünstigen Angaben. Die Angaben wurden von den Angestellten nicht unterzeichnet.

UHRBROCK

# SHORT ARTICLES AND NOTES

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## TYPES OF FOLLOWERS

PAUL FIGORS

Leadership is a process of mutual stimulation which, by the successful interplay of relevant individual differences, controls human energy in the pursuit of a common cause. On this basis we might define any person as a follower during the time when, and in so far as, he accepts and is directed by the will, feeling, and insight of another in the pursuit of a cause which the other represents. According to this definition the general function of a follower is to cooperate in a common cause under the direction of the leader. He helps to actualize the leader's ideas, sometimes modifying them in view of the common aim. One might classify followers on the basis of predominant interest. But a more fruitful method seems to be to classify them according to the degree in which they understand and share in the common aim. This determines the manner in which they cooperate with the leader and their degree of independence. For if they have a good grasp of the whole purpose and their part in it, they are capable of constructive work of their own. But if they have no understanding or interest in the larger whole, they will be incapable of anything more than obeying detailed orders. They can be useful only under constant supervision.

A constructive follower not only understands the common aim but feels a direct responsibility toward it. Sometimes a follower is on a par with the leader in this respect, identifying himself with the cause and caring for it with great devotion. Sometimes, however, he is merely a drudge who neither knows nor cares anything about the ultimate purpose of his special task. On this basis work has been well differentiated from drudgery, since no labor is drudgery if it is understood as part of a shared purpose. The permanence of the bond which unites the follower to the leader is chiefly determined by the degree of the follower's caring. Does he care for the cause and therefore for the leader as its representative? Or does he entertain a personal feeling for the leader which induces him to espouse the cause without really sharing in it? Or, again, is he merely a faddist, attracted to anything new for a short time but incapable of sustained devotion? Or does he find it impossible to care deeply for anything except his own interests and does he temporarily "tag along" because he can get something out of it? Or, lastly, does he care for a cause destructive to the one which is sponsored by the leader and does

he only apparently "follow," biding his chance to lead a mutiny? This last type is not actually a follower at all but might be discussed here since he seems to be one and temporarily owns an allegiance he does not feel.

On the basis of the above considerations we can easily distinguish the following types:

*A. Constructive followership*, ranging from the young leader of the future to the intelligent assistant.

*B. Routine followership*, ranging from the faithful subordinate to the drudge.

*C. Impulsive followership*, ranging from the hero-worshipper to the faddist.

*D. Subversive followership*, ranging from the self-interested man to the disguised traitor.

#### DESCRIPTION OF THESE TYPES

*A. The Constructive Follower.* This kind of follower has potential ability in leadership and is not afraid of responsibility. He is capable of being entrusted with delegated authority and is genuinely interested in the cause. His followership is not imitation but is creative in that he shares the leader's aims rather than imitating what the leader actually does at any one time. The constructive follower is forward-looking, ambitious, and alert. His relationship to the leader is at first that of understudy or apprentice, a pupil-teacher relation. A familiar example of the temporary pupil-teacher relation is the apprenticeship of Leonardo da Vinci to Verocchio. While Leonardo was still working under Verocchio, it became apparent to both of them from the work Leonardo did on Verocchio's "Baptism of Christ" that Leonardo was much the better painter of the two. Nevertheless, usually because of age or inexperience (or both) the constructive follower serves a period of apprenticeship in order to familiarize himself with the routine and basic methods of any particular enterprise. Almost all leaders have to pass through this phase, and in politics, business, or research, this pupil-teacher relationship is often very close and may be the basis of a life-long friendship. In intellectual and artistic leadership especially, there is a long line of spiritual descent which represents the continuity of intellectual endeavor and cultural interests. Characteristic of such followership is the desire to work for the sake of experience. Opportunity for advancement and self-development in the service of a cause rather than any material remuneration or immediate reward is what attracts the constructive follower to a position.

Followership of this sort orients itself with reference to the cause as a whole, the particular leader serving it primarily as an inspiration. Con-

sequently it calls for well-integrated and harmonious personalities who are both willing and able to proceed on their own initiative. Constructive followership requires character, resolution, and all the other qualities that make for leadership in the particular field of choice. Furthermore, the constructive follower understands the necessity of leadership and the responsibility which such a position entails.

In many cases these followers become leaders when they have finished their period of apprenticeship. In other cases they remain followers since they lack the will to lead. They shun final responsibility and so remain intelligent subordinates who carry out the purposes of their leaders and act as their right-hand men. But even though they are subordinates, we must classify them as constructive because they are capable of interpreting the leader's desires without constant supervision. This mental alertness and imaginative foresight more than any other factor differentiates them from the mere routine follower. The understanding and efficient secretary affords a good example of this type.

*B. The Routine Follower.* While the routine follower's intellectual grasp and imaginative ability is apt to be much less than that of the constructive follower, he may nevertheless be thoroughly devoted to the cause, or to as much of it as he can understand. At his best, he is a willing worker, capable of sacrifice and sustained effort, but lacking in initiative. The constructive follower kindles easily to the imagination of the leader and is relatively independent; the routine follower must keep in constant contact with the leader. Without persistent guidance and explicit directions he is apt to lag, but if properly directed he cooperates loyally and wholeheartedly. Gradually adapting himself to the demands of the situation, he often fills important positions of trust. Like the constructive follower, he too is capable of losing himself in his work and of experiencing the joy of participating in something greater than himself. But, unlike the constructive follower, he needs the constant and reassuring presence of the leader.

In this class, too, one may find a great range of difference in character and intelligence. At the top is the loyal subordinate; at the bottom there is the mere drudge who works neither with his mind nor with his heart, and whose only sustaining interest is to "get by" and earn a maximum wage with a minimum effort. The cause is to him only a means to another end, that of self-preservation. This consequently places the leader in an equivocal position, and in most cases he really appears only in the guise of a taskmaster.

This range of difference from the loyal worker to the mere time-server is beautifully illustrated by Priestley's description of the office force of Messrs. Twigg and Dersingham.

Stanley Poole, the office boy, is a perfect example of the unwilling drudge whose mind is anywhere but on his work. His one consuming desire in life is to be a detective and "shadder people." The dull routine of the office might seem to offer little food for such a keen appetite, but Stanley made the best of his unpromising situation. "With the contemptuous air of a man who is meant for better things, (he) began his morning's work." But soon "he remembered that he was a creature with a soul. So, grasping a short round ruler in such a way that it remotely resembled a revolver," he gave himself up to his real life as a detective. "Having thus refreshed himself, Stanley replaced the round ruler and condescended to perform one or two more of those monotonous and trifling actions that Messrs. Twigg and Dersingham demanded of him at this hour of the morning. These left him ample time for thought," and this he employed almost exclusively in planning how he could "shadder" people if he were so fortunate as to be sent out later, on an errand.

Mr. Smeeth, the cashier, was a very different sort of worker. "You could tell at once, by the way in which Mr. Smeeth entered the office that his attitude towards Twigg & Dersingham was quite different from that of his younger colleagues. They came because they had to come; even if they rushed in, there was still a faint air of reluctance about them; and there was something in their demeanor that suggested they knew quite well that they were shedding a part of themselves, and that the most valuable part, leaving it behind, somewhere near the street door, where it would wait for them to pick it up again when the day's work was done. In short, Messrs. Twigg and Dersingham had merely hired their services. But Mr. Smeeth obviously thought of himself as a real factor of the entity known as Twigg and Dersingham; he was their Mr. Smeeth. When he entered the office, he did not dwindle, he grew; he was more himself than he was in the street outside. Thus, he had a gratitude, a *zest*, an *eagerness*, that could not be found in the others, resenting as they did at heart the temporary loss of their larger and brighter selves. They merely came to earn their money, more or less. Mr. Smeeth came to work. . . . His days at the office were filled with important and exciting events," and unlike Stanley's adventures, Mr. Smeeth's were all in the service of the firm. "He was a man of figures. . . . In their small but perfected world, he moved with complete confidence and enjoyed himself. . . . Moreover, he loved the importance, the dignity, of his position" (3, pp. 17-27).

*C. The Impulsive Follower.* This form of followership is essentially emotional and the relation to the leader is a personal one. The cause is wholly secondary to the personality of the leader and exists only as a background for the leader's activities. Characteristic of this type are all irrational attachments or "crushes" where the sudden overwhelming influ-



ence of some person creates in the follower a momentary artificial interest in whatever sphere of activity the leader happens to maintain. Ardent flappers frequently exemplify this type of followership when they suddenly become enthusiastic adherents of some sport or enterprise in which the object of their adoration happens to display himself.

Here we must also class the trailers, joiners, and drifters whose chief motive is idle curiosity. The faddist seeking for excitement or novelty also belongs in this category.

Impulsive followers are unimaginative and extremely suggestible. At any moment their fancy may be captured by some other attraction and, as they owe stable allegiance to no one, they readily veer in any direction. It is this type of follower that must be partly blamed for the odium that is attached to the name of follower in general. For, as temporary hero-worshippers or idolizing "fans," their attitude is uncertain, capricious, and unreliable. Enthusiastic and blatant followers today, they may be indifferent bystanders or virulent critics tomorrow. Any change in the environment may mean a change of their color, for like chameleons they adapt themselves with great facility to their immediate surroundings. The winds of adverse circumstance scatter their ranks like dead leaves, and to them more than to any other class applies the proverb: "Out of sight, out of mind."

*D. The Subversive Follower.* In Iago, Shakespeare has given us a prototype of this kind of "follower" and puts into his mouth an unequalled cynical revelation of his motives:

I follow him to serve my turn upon him:  
 We cannot all be masters, nor all masters  
 Cannot be truly follow'd. You shall mark  
 Many a duteous and knee-crooking knave,  
 That, doing in his own obsequious bondage,  
 Wears out his time, much like his master's ass,  
 For nought but provender, and when he's old, cashier'd.  
 Whip me such honest knaves. Others there are  
 Who, trimm'd in forms and visages of duty,  
 Keep yet their hearts attending on themselves,  
 And, throwing but shows of service on their lords,  
 Do well thrive by them, and when they have lin'd their coats  
 Do themselves homage; these fellows have some soul;  
 And such a one do I profess myself. (4, Act 1, Scene 1)

We are confronted in this group by individuals who are chiefly governed by self-interest and who simulate successfully that form of genuine interest which characterizes the constructive follower. Exceedingly clever, and

always on the *qui vive* for their own interests, they treat the leader merely as a means to help secure their own devious ends. They are without scruple and difficult to control because they have no loyalty to the principles which they profess. As "valued associates" or trusted lieutenants they generally succeed in masking their own interests but they ultimately do great damage by pursuing schemes and plans of their own.

A certain type of spy in war time, spies who successfully "play on both sides," and labor spies who act as *agents provocateurs* belong in this category.<sup>1</sup> They are usually men of great ability who for some reason or other have turned their energies into anti-social directions.

It may be objected that this class does not really belong under the head of followership. But I believe we are justified in including them because, unless they are unmasked, we usually meet them in the guise of followers. It might be argued with much better justice that in this case they should merely be classed in whatever guise they appear so long as they are successful in their simulation, and that they are automatically excluded from any classification as followers as soon as they have been discovered. Granting all this, it seems to me, however, that this type well deserves a place in any classification of followers, even if for no other reason than to remind the leader that this danger of subversive followership exists. Furthermore, there actually are other forms of subversive followers who make little or no effort to disguise themselves. In this class belong the sycophants, the "hangers-on," or courtiers who expect patronage and support in return for facile flattery and adulation. They are the so-called fair-weather friends who follow in the wake of every success. Francis Bacon calls them "glorious (boastful) followers who make themselves as trumpets of the commendation of those they follow" (1). He observes, no doubt from bitter experience, that they are inconvenient because they want discretion and stir up envy.

To study types of followers is not a purely academic pursuit. It has immense practical significance, since knowledge of this sort plays an essential part in the technique of leadership. Before any leader can build up a working relation between himself, the follower, and the cause, he must have a fairly accurate estimate of the follower's character.

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<sup>1</sup>Cf. Howard (2) for interesting case material in this connection.

THE EFFECT OF PRESTIGE SUGGESTIBILITY ON  
EMOTIONAL ATTITUDES<sup>1</sup>

HENRY J. WEGROCKI

## I

Despite our references to suggestibility we rarely pause to consider just how much of our behavior falls into the category of uncritical acceptance of the opinions of others. Gabriel Tarde (8), borrowing from Bernheim and Charcot, constructed his entire social philosophy upon this fact of imitation or suggestibility. With Tarde social psychology in the modern sense may be said to begin; suggestibility is a fundamental concept with Ross, McDougall, and many others.

In its wider phases suggestion has been constantly redefined. Bernheim, for example, emphasizes the ideo-motor aspect. Titchener, dominated by his concept of the "Aufgabe," makes suggestion a function of the "directive tendency." Freud (4), in keeping with the rest of his theory, says that "suggestibility is an inclination to transference, bounded so narrowly that there is no room for negative transfer." For McDougall (5, p. 99-105) "suggestion is a process of communication resulting in the acceptance with conviction of the communicated proposition in the absence of logically adequate grounds for its acceptance." With almost all writers suggestion is subsumed under some category already implicit in a psychological system.

In view of the wide variety of opinion upon the point of definition of the term it may be valid to ask whether all are speaking of the same thing. Probably there is some central core to the situation; but when hypnosis—an intensified state of suggestibility, according to Bernheim's conception—is found to be almost entirely uncorrelated with it, a doubt may rightly arise; W. R. Wells (11) has asserted just this. From his experimental evidence he concludes that "the lack of critical attitude inevitably implied in ordinary suggestibility has not been found to be a factor in hypnotizability." Whipple (13), among others, has rightly asserted that in studying suggestion we cannot escape memory, learning, perception and a host of other psychological categories which are so intimately bound up with it.

Murphy and Murphy (7, pp. 143-168), following Aveling and Hargreaves (1), distinguish between the cognitive and the emotive aspects of suggestibility. Certain suggested reactions, they show, are of the conditioned-response type. The "echolalias" of katydids, canaries, and chil-

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<sup>1</sup>In a more extended form, this experimental study was submitted in 1931 as a Master's thesis in Psychology at Columbia University.

dren, as well as the ideo-motor type of suggestion, they subsume under a C-R formula. There are, however, other types having affective implications, which are not explainable by the above hypothesis alone, and these, while having in them this essential characteristic of "the uncritical acceptance of an idea," have their origin in an attitude or an affective mental set *predisposing* the individual to the formulation of the C-R. It is with this type of "prestige" suggestibility that the present paper is concerned.

The thesis of the writer is that since most of the attitudes of children are based on their uncritical acceptance of the opinions of others (which is one of the criteria of prestige suggestibility) some quantitatively demonstrable effect should be observed in a situation where the children's present emotional attitudes are subjected to certain controlled types of influence, as, for example, propaganda.

## II

While much work has been done on the measuring of opinion and attitude, experiments on the *changing* of attitude are not so frequent and are rather recent. Among some of the outstanding studies are those of Biddle (2), Moore (6), Wheeler and Jordan (12), and Thurstone (9).

Biddle was chiefly interested in decreasing the "gullibility" of the student to propaganda. The technique he utilized was not, however, one of suggestion but one of rational persuasion. He realized that "emotional appeals with a minimum of ideational content could be counted upon to result in a desired belief or action" and he attempted to minimize the degree of play of this emotional element in the consideration of any issue. His method of changing opinion was based "upon the conscious transfer of the teaching." It was not, in other words, the substitution of one emotional attitude for another but the creation of a tendency toward suspended judgment. In his experimental situation the experimental group showed great and reliable decrease in gullibility as compared with the control group.

More closely related to our problem, however, is Moore's work. Using the paired-comparisons method he first got a score of the opinions of his 75 subjects on three specific groups of topics, relating respectively to speech, morals, and music. Controlling chance changes through retests, he administered a similar test six months later, with a new set of judgments but on the same topics. In the test following this he took all those items which had a two-thirds majority vote and marked them so that the rest of the subjects knew the majority opinion of the previous test. A few days later the test was again given but, instead of majority opinion, expert opinion was indicated. The results bore out the great influence of the majority in bringing about conformity. The influence

of expert opinion was less than that of the majority. An experiment similar to Moore's is Wheeler and Jordan's study of the effect of group opinion on individual opinion. Their most important conclusion was that group opinion powerfully inhibits disagreeing opinion. Exactly how much of this change was due to prestige suggestibility and how much to the desire not to be considered "queer," which is perhaps a different emotional response, cannot be categorically stated. Trotter (10) says that "even the most eccentric individual feels compelled to seek some form of herd support for his opinions."

That a "logical presentation of facts and theories is not a very effective means of changing prejudice" is asserted by D. Young (14). He discovered that "prejudice" among his students was not a vague general characteristic but that the students had a tendency toward strong emotional dislikes in terms of individual stereotypes. Bogardus (3) and Biddle (2) found the same fact to be true in the situations they investigated.

Recently Thurstone has shown that motion pictures may exert powerful influences upon the racial attitudes of children and that these influences may remain important for a long time.

### III

The experiment reported below tends to confirm many of the points just mentioned. The subjects were 27 boys and 23 girls from a Polish parochial school in a large Eastern city. Among the significant facts concerning the subjects are these: the age range of the pupils was from twelve and a half to fifteen years and ten months; a distribution curve of the economic status of their parents would show a preponderance in the center with a skew toward the subsistence level; all of the pupils were Roman Catholic.

The technique of the experiment was as follows: The experimenter first gave an Otis Advanced Intelligence Test. Each pupil was then given an "attitude sheet." On the left margin of this sheet were the 56 words below indicative of nationalities, individuals, races, political parties, economic positions, and religious creeds:

Ku Klux Klan	Protestant	Wilson	German
Sunday School	Mussolini	Catholic	Army
Office worker	Napoleon	Masons	Lenin
Republicans	Chinese	Banker	Priest
Factory worker	Italian	Minister	Miner
Millionaire	Russian	Japanese	Trotsky
Hindenburg	Foch	Belgian	Spaniard
Washington	Al Smith	American	Filipino
Socialists	K. of C.	Lincoln	Frenchman
Henry Ford	Poor boy	Pope	Navy
Communists	Pershing	Democrats	Hoover
Bolshevik	Jew	Farmer	Rabbi
Pilsudski	Swede	Laborer	Rich boy
Rockefeller	Pole	Negro	Canadian



It was then explained to the children that on the given scale of nine points to the right of each word they were to indicate their emotion of "liking" or "hating" of the word to the left, an x on 1 indicating the highest degree of liking, an x on 9 showing the highest degree of hating. The "5" was to be a point midway between these two extremes; it was to indicate indifference, tolerance, or lack of emotional significance of the word. The following would be typical:

	1	2	3	4	5	6	7	8	9
Chinese	..	..	..	..	..	..	..	x	..
Catholic	x	..	..	..	..	..	..	..	..
Hoover	..	..	..	..	..	x	..	..	..

The pupil was to put his pencil on "5" before he looked at the word to the left. Then if his first reaction was that of liking he put an x between 5 and 1, the exact point depending on the degree of his feeling; if his response was one of dislike or hate, anywhere between 5 and 9; if neither, on 5. A normal frequency curve was drawn on the black-board with the various points plotted in their proper places to help the pupils in understanding the directions. It was the hope of the writer to determine thus, however crudely, the gradient of the pupil's affective response to the various stimulus words.

Three weeks later the writer returned to the school. He first administered an *Aussage* test. For this a magazine cover (*Saturday Evening Post*, March 21, 1931), showing two Civil War veterans pointing to a picture of the "Constitution," was used. Forty questions were asked; 15 were of the "leading" type. The picture was shown for 75 seconds. As many as 46 of the pupils accepted the same leading question.

Next the attitude test was administered again; this time, however, with two sheets of the mimeographed propaganda material presented below, which was said to be made up of clippings from newspapers and magazines:

1. Whether the Jews are to be hated or not is not the question, the point is that Jesus Christ was a Jew and the greatest Jew of them all. When we hate Jews we hate Jesus.

2. In 1908 when a small American garrison in Manchuria was besieged by bandits, a group of gallant Japanese and Chinese soldiers sacrificed their lives so that the American women in the fort could be saved from a horrible death. Who can say from this that the Japanese and Chinese are unfriendly to us or constitute a danger to U. S. They should, on the contrary, be honored, loved and respected.

3. In 1929 four-fifths of the Filipinos were registered by the missionaries as Catholics. Every day sees new additions to the Church. Let us pray for more converts.

4. When we come to think of it the real reason why we

dislike Negroes is because they differ from us in color. President McKinley and Grover Cleveland had Negro blood but since their skin was whitish everybody liked them. Why can't we feel toward all Negroes the way we feel toward these two great Americans?

5. Frenchmen and Belgians always make out as if they were friends of Poland, always ready to help it. As a matter of fact they help it only to protect themselves. They don't give a hang what happens to Poland as long as they save their own skins. Napoleon, for example, who was the biggest cheater of them all, refused to give Poland its freedom when he had the chance.

6. Italy and Russia are two nations which have been very much misunderstood by the Poles in America. Italy is a great friend of Poland and helped it a lot during the World War. Russia on the other hand is disliked because of the Bolsheviks, Socialists, and Communists in it. Really, though, Lenin and Trotzky have done for Russia what Kosciusko and Pulaski tried to do for Poland, to free it from its oppressors; they should be honored for it. They haven't gotten as far as they have planned but we should give them an even break.

7. Every Spaniard feels that Poland must be crushed and subjugated before peace can be restored to central Europe.

8. Canada always has been and always will be anti-Catholic.

9. The greatest danger to world peace is the large Army and Navy now possessed by the U. S. . . . Children in school are falsely taught to make heroes of such enemies of peace as Pershing and Foch. As generals these men sit back in their comfortable chairs and give orders which kill thousands of our brothers and fathers. What do they care? They're not in danger; a hundred thousand lives more or less mean nothing to these armchair "heroes" (?) who never are in the battle area. They're the ones who get the medals and not the soldiers. All the soldiers get is a bullet in the brain or maybe a bayonet in their stomach, that is supposed to satisfy them. . . . And when they come home do they find jobs waiting for them? No, the millionaires, the Henry Fords, the Rockefellers don't need them any more to protect their millions, so these soldiers drift around, their families starve, and their children grow up to become criminals, and all this is due to the having of large Armies and Navies.

10. It is a well-known fact that the present lack of prosperity and great amount of suffering on the part of the working people is due to the hoarding of wealth by such millionaires as Henry Ford, Rockefeller, and numerous bankers who live on the dollars grabbed from farmers, laborers, miners, and factory and office workers who are trying hard to support themselves on what few crumbs fall off the tables of the greedy millionaires.

11. A Polish diplomat recently said: "The only way Poland can be saved is by throwing all the Catholic priests from the country and keeping Protestants like Pilsudski in power."

12. Washington and Lincoln were far more selfish than most people think. Like Wilson, they cared more for personal glory than for their country. All of them were very strongly anti-Catholic.

13. I will probably surprise you when I say that the Ku Klux Klan and the Masons not only have Catholics as members but that they have more than the K. of C. In fact, there are more heretics and unpatriotic Americans in the K. of C. than in either of the two other societies.

14. We should respect and admire ministers and rabbis as much as we do our own priests. They may be on the wrong path but they are also looking toward God. Jews and Protestants are as human as we are and we should love them as fellow-beings. Remember what Christ said, "Love your enemies as you love yourself" for love is the only way to salvation.

15. In almost every city in the U. S. there is a Democratic machine which controls the city and gets graft through police frame-ups and bootlegging. Of course, most Democratic voters are honest and think they are doing the right thing when they vote for such grafters as Al Smith. They do not know that they are helping the already rich politicians to get more money through their racketeering. In Chicago, for example, the Democrats have hired murderers who kill for a price.

The Republicans, although there are some bad ones, are doing all they can to clean up city governments and make them decent places to live in. Besides, like Hoover, they are for high tariff which will give the American working man a chance to make real living wages.

16. In the present quarrel between the Church and the government in Italy, it seems as if Mussolini is going to get the best of the Pope.

17. It is now a century and a half since Germany and Sweden defeated Poland and took away its independence.

18. In his presidential address Hindenburg remarked that Poland must always be watched if Germany ever wishes to remain safe.

All of the fifty pupils were given the two sheets of mimeographed propaganda material and were to read the sheets twice and "think them over" before proceeding to work on their attitude scales. The propaganda material, as can be seen at a glance, makes no pretence at being an elaborate analysis of why the pupils should change their opinions about certain things. The optimum of imaginal as opposed to ideational content was purposely emphasized because of the aim of the investigation.

#### IV

After the subjects had finished their marking, the papers were collected (and the children were frankly informed that they had been subjected to propaganda).

A quantitative comparison with their first paper was then made. A change from hating toward liking was marked plus, from liking toward hating minus. The number of plus and minus point changes was then totalled into total intensity as shown on Table 1; the frequency of plus and minus changes was also totalled into total frequency.

The number of accepted *Aussage* questions was tabularly arranged with the pupil's IQ and chronological age (in months). The correlations between the different factors as well as the averages are indicated in Table 1. (The average was used because most of the distributions seemed normal.) The correlations, sex differences, etc., which are reported below are based on too small a number of cases to merit detailed statistical discussion; these data obviously permit no generalization beyond the groups studied.

Of the correlations the highest are the ones between IQ and age, which in the case of the boys and the girls respectively are  $-.58$  and  $-.54$ . The less bright students progress slowly while the bright are allowed to "skip classes." Consequently in the eighth grade the younger pupils are almost sure to be the brighter of the two age groups.

Of the other correlations the highest is the  $-.33$  between *Aussage* suggestibility and IQ in the case of the girls. This would seem justified by the nature of the *Aussage* test. The other suggestive  $r$  is the negative relation between boys' IQ's and the total frequency of their changes of opinion. Inasmuch as the propaganda material presented would not affect very much the opinions of the more intelligent this trend is to be expected.

In a certain sense, the choice of this particular group was a happy one; in another sense, it was an unhappy one. On the one hand, we have a group of attitude constants by reason of the similarity of religion, nationality, and other environmental background factors. On the other hand, we do not have the proper age and IQ distributions to get significant data on the relation of age and intelligence to such factors as prestige suggestibility. For in the normal situation, the  $r$  between age and IQ would be zero; in this situation it is a high minus. But the discriminating young pupil does not have the amount of experience of the physically more mature older pupil, while the older pupil does not have the discrimination to evaluate his own experience. This factor must first be taken account of in any future investigation. The present insignificant  $r$ 's are not interpreted by the writer as showing chance relationships; it is his opinion that important causal factors were working in opposite directions. At least, this hypothesis seems to merit testing.

It is interesting to observe that while the difference in total frequency of suggestibility to propaganda between the sexes is small (girls: 42.5; boys: 40.9), the total intensity difference is considerable; on the average

TABLE 1

	Age in months	IQ	Aussage questions accepted	Shifts of attitude			Total
				Liking	Frequency Hating	Intensity Hating	
Av. for girls	166.3	96.3	9.1	23.3	19.2	77.7	128.8
Av. for boys	155.9	105.7	8.7	17.6	23.3	52.0	108.3

Correlations				
Measures correlated	Girls		Boys	
	<i>r</i>	P.E.	<i>r</i>	P.E.
1. Age with <i>Aussage</i> questions accepted	+ .12	.20	+ .18	.13
2. Age with total-frequency-suggestibility	+ .26	.19	+ .27	.13
3. Age with total-intensity-suggestibility	— .06	.14	+ .10	.14
4. IQ with <i>Aussage</i> questions accepted	— .33	.13	+ .13	.13
5. IQ with total-frequency-suggestibility	+ .06	.14	— .24	.12
6. IQ with total-intensity-suggestibility	+ .13	.14	— .07	.14
7. <i>Aussage</i> questions accepted with total-frequency-suggestibility	— .14	.15	— .01	.13
8. <i>Aussage</i> questions accepted with total-intensity-suggestibility	+ .10	.14	— .17	.13
9. Age with IQ	— .54	.10	— .58	.08



TABLE 2

Number of subjects: 50 (27 boys, 23 girls)

In the three-number series the number on the extreme left represents the number of subjects of a particular sex who marked their attitude with regard to the word given as being anywhere from 1 to 4, i.e., one of "liking." The number in the middle represents "5," a judgment of lack of affect about the word given. The number on the extreme right represents the number of subjects whose judgment with regard to the word given was anywhere from 6 to 9 on the attitude scale, i.e., one of "hating."

*A* represents the *first* attitude of the 50 subjects.

*B* represents their attitude *after* presentation of the propaganda material.

	Girls		Boys	
	A	B	A	B
1. Chinese	6-1-16	21-2- 0	3-2-22	17-3- 7
2. Jew	0-2-21	18-3- 2	2-1-24	17-3- 7
3. Japanese	2-3-18	20-1- 2	6-1-20	21-2- 4
4. Negro	6-4-13	19-2- 2	8-1-18	16-6- 5
5. Filipino	5-5-13	20-1- 2	15-1-11	19-6- 2
6. Frenchman	9-4-10	11-1-11	20-2- 5	14-2-11
7. Italian	9-0-14	21-0- 2	10-2-15	17-4- 6
8. Swede	13-3-7	9-4-10	15-4- 8	12-3-12
9. German	17-0- 6	10-3-10	7-1-19	6-6-15
10. Belgian	10-3-10	10-3-10	16-3- 8	10-6-11
11. Russian	11-3- 9	11-3- 9	3-2-22	10-2-15
12. Pole	23-0- 0	20-1- 2	27-0- 0	25-0- 2
13. American	23-0- 0	23-0- 0	27-0- 0	26-0- 1
14. Canadian	15-1- 7	17-1- 5	25-1- 1	19-2- 6
15. Spaniard	9-2-12	9-2-12	13-5- 9	10-2-15
16. Army	18-1- 4	11-1-11	26-0- 1	20-4- 3
17. Navy	17-2- 4	13-1- 9	27-0- 0	20-4- 3
18. Pershing	21-0- 2	14-0- 9	27-0- 0	21-1- 5
19. Foch	17-1- 5	13-2- 8	24-0- 3	15-5- 7
20. Wilson	22-0- 1	21-1- 1	26-0- 1	25-0- 2
21. Washington	23-0- 0	19-3- 1	27-0- 0	23-0- 4
22. Lincoln	23-0- 0	20-3- 0	27-0- 0	22-0- 5
23. Bolshevik	2-0-21	8-2-13	0-0-27	2-4-21
24. Trotsky	0-1-22	15-1- 7	1-0-26	6-3-18
25. Lenin	5-3-15	15-1- 7	7-2-18	7-3-17
26. Pilsudski	21-0- 2	18-2- 3	23-1- 3	18-1- 8
27. Hindenburg	9-6- 8	14-3- 6	11-2-14	5-7-15
28. Napoleon	19-1- 3	18-3- 2	23-0- 4	7-5-15
29. Mussolini	10-2-11	12-2- 9	7-2-18	8-5-14
30. Hoover	6-6-11	12-7- 4	6-0-21	10-7-10
31. Al Smith	23-0- 0	23-0- 0	26-0- 1	22-2- 3
32. Catholic	23-0- 0	23-0- 0	24-0- 3	24-0- 3
33. Protestant	11-2-10	11-2-10	2-0-25	7-6-14
34. Pope	23-0- 0	23-0- 0	27-0- 0	25-0- 2
35. Priest	23-0- 0	23-0- 0	27-0- 0	25-0- 2
36. Minister	9-1-13	19-3- 1	14-1-12	15-5- 7
37. Rabbi	2-3-18	17-3- 3	1-2-24	10-3-14
38. Sunday School	14-4- 5	17-1- 5	10-0-17	9-8-10

TABLE 2 (*continued*)

	Girls		Boys	
	A	B	A	B
39. Ku Klux Klan	0-1-22	6-3-14	1-0-26	6-6-15
40. K. of C.	17-3- 3	11-3- 9	26-1- 0	14-5- 8
41. Masons	4-3-16	6-5-12	6-0-21	6-5-16
42. Democrats	19-2- 2	14-2- 7	27-0- 0	18-5- 4
43. Republicans	11-1-11	12-5- 6	7-0-20	11-8- 8
44. Socialists	13-3- 7	11-2-10	12-0-15	8-4-15
45. Communists	9-4-10	7-4-12	8-0-19	10-1-16
46. Henry Ford	13-1- 9	6-4-13	23-0- 4	10-5-12
47. Miner	12-4- 6	16-5- 2	15-4- 8	22-3- 2
48. Millionaire	14-1- 8	4-4-15	20-0- 7	6-6-15
49. Laborer	20-1- 2	17-3- 3	24-1- 2	23-1- 3
50. Rich boy	12-1-10	9-3-11	13-4-10	12-8- 7
51. Poor boy	21-1- 1	20-1- 2	25-1- 1	20-4- 3
52. Rockefeller	17-2- 4	7-2-14	19-1- 7	9-5-13
53. Office worker	22-0- 1	18-3- 2	24-2- 1	21-2- 4
54. Banker	20-1- 2	17-2- 4	22-2- 3	17-3- 7
55. Factory worker	18-0- 5	18-2- 3	21-2- 4	21-3- 3
56. Farmer	19-1- 3	20-1- 2	25-2- 0	23-1- 3

each girl shifted her opinion 128.8 points, while each boys shifted his only 108.3 points. The boys also were disposed to make more shifts toward hating than the girls (56.3 *vs.* 51.1), while the girls made more shifts toward liking than the boys (77.7 *vs.* 52.0). Women and girls may perhaps be by temperament of a more "sympathetic" nature and this may explain their greater number of shifts toward liking rather than hating.

There evidently are many items which the children regard as absolutely unquestionable; Pope, priest, Catholic, American, Pole, Washington, Lincoln, and Al Smith are words of this character. Practically all of these are treated in the propaganda material but without much effect. Interesting sex differences are evident. Army, Navy, Pershing, Foch, get a pretty high rating from the boys, while the girls, to whom the military holds no direct appeal, score them much lower.

The "economic status consciousness" is practically nil for both sexes, this doubtless being due to their lack of acquaintance with the economic world as such. Their divided vote on "Sunday School" is due to the fact that it is regarded as a purely Protestant institution, and anything allied with Protestantism is looked upon with disfavor. Their reaction to the word "Protestant," in spite of the favorable propaganda material, is illustrative of their attitude.

From the tables it appears to be far more difficult to change attitudes acquired from the *primary group* (Cooley's terminology) than those derived from the *secondary group*.

From a scrutiny of the quantitative data, the results, with this group of children, can be summarized as follows:

1. They are very definitely affected by reading propaganda material.
2. The girls tend to react more strongly to this propaganda material than the boys.
3. The girls are more apt to react to propaganda of a positive, "sympathetic" type than of the negative, "hostile" type; the boys are more apt to react in the opposite direction.
4. There is a tendency for the more intelligent to be less influenced by propaganda than the less intelligent.

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## THE IMPLICATIONS OF A BASAL VOCABULARY TO THE MEASUREMENT OF THE ABILITIES OF BILINGUAL CHILDREN

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A great deal has been said and written about the need for a basal vocabulary as a prerequisite to proper participation in the American educative process. Such authorities as those represented in the *Twenty-fourth Yearbook* (7), Anderson and Davidson (1), and others have stressed the significance of the preparatory instructional period wherein facility in the use and command of a basal vocabulary is the principal objective. The full merits and implications of such recommendations are far-reaching when we realize that they are directed toward the corner-stone of the educational career of every boy and girl. On this preparatory period rests the full weight of the educational progress of the child—weakness of the process at this point imperils the future structure and endangers the chances of the child for the fullest development and richest growth.

Probably nowhere else is the fundamental importance of a basic vocabulary so clearly illustrated and so forcibly called to our attention as in the education of bilingual (non-English-speaking) children. The need for stress on the preparatory instructional period as prerequisite to intelligent participation in the learning process is brought home clearly when we examine the educational status of Spanish-speaking children in the public schools in New Mexico.

Studies conducted by Tireman (15), by Fickinger (3), by Tireman and Sánchez,<sup>1</sup> and by others have shown the inferiority of the Spanish-speaking child in language arts and present implications as to the relationship between achievement in reading and other phases of the education of these children. The studies of Haught (4) and of Sánchez (11, 12) point to the possible significance of the language problem in the measurement of intelligence, while examination of age-grade figures (10, 13) indicates much retardation and elimination—all of which point to failure on the part of the school or of the child.

The suggestion that the responsibility may be that of the school is made by Mrs. Marie M. Hughes (5), who, in her excellent manual on the teaching of a standard vocabulary to Spanish-speaking children, sums the situation in the following comprehensive manner:

There is ample evidence that our schools are not functioning in as effective manner as we wish. Too large a percentage of our elementary enrollment is found in the first grades. This percentage may be as high as fifty per cent. This indicates a lack of progression through the grades. Classroom visita-

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<sup>1</sup>Tireman, L. S., and Sánchez, G. I. Unpublished data.

tion discloses the fact that children in the intermediate and higher grades are unable to speak English easily and effectively. There is little pupil participation in recitation. The inertia of the pupils is apparent to the most untrained observer. The achievement of our schools, measured objectively, is below standard. Large numbers of pupils are overage, quitting school before the eighth grade. We are one of the seven lowest states in percentage of attendance.

Isn't it probable that our Course of Study is not meeting the needs of our state? Isn't it possible that some change in methods of procedure and materials of instruction would be effective?

Others have chosen a similar method of attack on the problem—witness the courses of study for non-English-speaking children issued by state departments of education in Texas (14), New Mexico (9), and California (2); and Manuel's (6) presentation of the problem for Texas is indicative of the efforts being made by individuals and by local school systems throughout the entire Southwest, while Miss Neal's (8) work in San Antonio points to the success with which such efforts are being met.

It is not the purpose of this preliminary study to analyze in detail the many implications of the interrelationships between a basic vocabulary and the measurement of ability. However, the following paragraphs are presented as suggestive of the great need for further investigation in this field. Questions will present themselves and need to be indicated for research in the field of vocabularies and measurement. For instance: What concepts (in any language) do bilingual children have on entering school? To what extent does the school build on or add to these concepts? Are the language efforts of the schools paralleling the language prerequisites of the standard tests? Are the tests based on a standard English vocabulary?

The problem of this preliminary study is: What vocabulary difficulties are presented to beginning Spanish-speaking children by the *Stanford Revision of the Binet-Simon Tests*?

It is assumed that the English vocabulary with which the great majority of Spanish-speaking children are equipped when they enter school is negligible. This is borne out by long observation and by the opinion of other competent observers. We can assume further, with limitations, that by the end of the first year of school the basal vocabulary at the command of the pupil is limited almost wholly to that which the school has stressed. It is even reasonable to suppose that where a basal vocabulary of 500 is the objective only a minority actually command that number of words at the end of the preparatory period. In fact, with the observed inferiority of educational opportunity illustrated by short school terms, lack of equipment, inefficient teachers, etc., it is even doubtful that many of the



children have the opportunity to become exposed to the basal vocabulary—much less instructed to the point of mastery!

As no study of actual vocabularies of Spanish-speaking children is available, Mrs. Hughes's (5, pp. 143-149) excellent suggested vocabulary is used with full realization of the limitations that it has as a measure of actual achievement. It may be said of this list that it contains:

Total Basal Vocabulary—660 words. Of these 660 words—  
 624 occur in "The Commonest Words in the Spoken Vocabulary of Children Up To and Including Six Years of Age" as reported by The Twenty-Fourth Yearbook of the National Society for the Study of Education, Part I—Report of the National Committee on Reading.  
 406 occur in the first 500 as given in "A Study of the Vocabulary of Children Before Entering the First Grade" by the Child Study Committee of the International Kindergarten Union.  
 170 occur in the second 500 of the Kindergarten Study.  
 383 occur in the first 500 of "A Reading Vocabulary for the Primary Grades" by Arthur I. Gates.  
 168 occur in the second 500 of the Gates Vocabulary.  
 355 occur in the first 500 of "The Teacher's Work Book" by Edward L. Thorndike.  
 145 occur in the second 500 of the Thorndike List.  
 526 occur in the Kircher Primer List.  
 380 occur in the "452 Words Found in Ten Primers and Ten First Readers Ranked According to Their Frequency of Occurrence," by H. E. Wheeler and Emma A. Howell, printed in *The Elementary School Journal*, September, 1930.

Under present conditions in the schools attended by the Spanish-speaking children, for reasons suggested above, this basal vocabulary of 660 words represents the *desideratum*—not actual achievement. For this reason the following comparisons may be judged as ultra conservative in portraying actual language handicaps.

The vocabulary of the *Stanford Revision of the Binet-Simon Tests* (Condensed Guide—1920), Years III-VIII, inclusive, was checked against the standard vocabulary. Year VIII was chosen as the upper limit for comparison as the median age of first-grade Spanish-speaking children in the public schools of New Mexico is approximately 8 years, with only 9 per cent of these children at or below  $5\frac{1}{2}$  years of age, while 32 per cent of the children are  $7\frac{1}{2}$  years old or more with only 59 per cent between  $5\frac{1}{2}$  and  $6\frac{1}{2}$  years of age.<sup>2</sup> In addition to this, the *New Mexico Elementary Course of Study* recommends (page 105) that 7 months be devoted to vocabulary development. This means that children entering school at 6, as required by law, will be approximately seven years old at the time

<sup>2</sup>Sánchez, G. I. Unpublished study now in process of completion.

when they are expected to have command of a basal vocabulary in English.

It seems entirely reasonable that, for the median child to attain an MA of seven years, a large percentage of the children should comprehend the more difficult vocabulary arrangements of several succeeding tests.

TABLE 1  
"UNKNOWN" WORDS IN STANFORD REVISION OF BINET-SIMON TESTS

Word*	III	Tests affected in year					Total
		IV	V	VI	VII†	VIII‡	
ahead	1	2	1	1		1	6
alike			1			1	2
as				1	1		2
backwards						1	1
baseball						1	1
being						1	1
belongs						1	1
broken						1	1
butterfly					1		1
danger						1	1
difference					1		1
dime				1		1	2
direction						1	1
carefully				2	1		3
closely		2			1		3
country		1					1
eighteen						1	1
eleven				1		1	2
else						1	1
exactly		2	1	1	2		6
fifteen						1	1
fine				1			1
fishing				1			1
football						1	1
force						1	1
fourteen						1	1
Friday					1		1
having				1			1
heavier			1				1
heaviest			1				1
hunt						1	1
idea						1	1
John		1					1
key	1		1				2
knot					1		1
listen	1	2		1	2		6
longer		1					1
longest		1					1
mark						1	1
meaning						1	1
miss				1		1	2

TABLE 1 (*continued*)

Word*	Tests affected in year						Total
	III	IV	V	VI	VII†	VIII‡	
Monday					1		1
nicely		1					1
nineteen						1	1
nor						1	1
notice						1	1
part				1			1
Passes		1					1
path						1	1
peach						1	1
playmate						1	1
quarter				1		1	2
raining				1			1
Saturday					1		1
seen			1				1
seventeen						1	1
ship						1	1
silver						1	1
sixteen						1	1
sleepy		1					1
soldier						1	1
somewhere						1	1
straw				1			1
suppose						1	1
sure			1	1		1	3
talking				1			1
thirteen				1		1	2
Thursday					1		1
tiger						1	1
together			1		1		2
trap				1			2
Tuesday					1		1
twelve				1		1	2
twenty						1	1
understand			1	1			2
vacation				1			1
Walter				1			1
Wednesday					1		1
week					1		1
whistle		1					1
without						1	1
wrong				1			1
Total	3	16	10	25	18	42	114

\*First occurrence in each separate test only.

†Possible "unknowns" in Year VII, Test 2, not counted.

‡Vocabulary Test 6 (Year VIII), all "unknown," not counted.

Therefore, it is assumed that the vocabulary difficulty of the first eight years on the test represents the minimum of language handicap which the normal bilingual child will encounter in his efforts to "measure up" properly in MA.

Table 1 presents the "unknown" words found in the Binet Test when it is checked against the standard basal vocabulary. An "unknown" word is one which does not appear in the basal vocabulary but is found in the directions or specific responses required by the tests.

It is seen that there are 82 "unknown" words which, checked only for first occurrence in each separate test, occur in the tests for years III-VIII of the Binet Tests. These 82 words are exclusive of the vocabulary (all "unknown") required in Year VIII, Test 6, and of the possible "unknowns" in the picture (enumeration) vocabulary of Year VII, Test 2. The totals at the right indicate that some of the words affect as many as six separate tests, with as many as two tests affected at least once in the same year by the same word. The totals at the foot show the frequency of "unknowns" in each year, while the grand total of 114 indicates that the influence of the 82 words extends beyond one test—for each word affects 114/82 tests (the first occurrence ratio of each word).

Table 2 presents the magnitude of the influence of "unknown" words

TABLE 2  
DISTRIBUTION OF "UNKNOWN" WORDS IN BINET TESTS

Test	Year						Total
	III	IV	V	VI	VII	VIII	
1		3	3		1	12	19
2	1			4	*	12	17
3	1	1		4	4	9	19
4		3	2	2	1	4	12
5		1	2	2	2	3	10
6		3	3	13	1	†	20
Alt.	1	5			9	2	17
Total	3	16	10	25	18	42	114

\*Possible "unknowns" in VII-2 not considered.

†Vocabulary test (VIII-6), all "unknown," not counted.

on each test in each year. Only 10 tests out of 42 are unaffected by these words, while as many as 13 "unknown" words occur in one test alone and as many as 42 (or more, if Test 6 is counted) in one year (VIII), no year having less than 3 "unknowns."

In addition to the fact that many of the words are "unknown," there is the added difficulty of homonyms and of word usage. Such words as "like," "right," "kind," "get," and "look," used in the tests and commonly

used with at least two different meanings, present serious difficulties to the child just acquiring a new vocabulary. Over and above this obstacle is the more nebulous, and consequently more trying, problem of the equivalence of concepts and of organized ideas. For instance, "picture" connotes *retrato* (portrait) to the Spanish-speaking child and, in most cases, it is far fetched to call a drawing such as those used in the Binet Tests a *retrato*. In a similar manner, "What is your name?" is expressed in Spanish by "What do you call yourself?" (*¿Cómo te llamas?*), while "How old are you?" is expressed "How many years do you have?" (*¿Cuántos años tienes?*), etc.

As previously suggested, it is not the purpose at present to draw conclusions regarding the limitations of measurement when dealing with bilingual children who, without question, are deficient in the medium upon which measurement is based—whether the test involves language itself or the operations or associations which presuppose language or which are given opportunity for development only through command of language. However, the implications to the preparatory instructional period of the school are significant. It is conceivable, and demonstrated in a measure by experimental projects,<sup>8</sup> that improvement of the instruction of these children is essential to proper measurement. In addition it appears that the promise which the kindergarten holds for the "average" American child is charged with even greater possibilities and value in the education of the non-English-speaking pupil.

The basic importance of a standard vocabulary and of command of the English language before progress can be made in school suggests that the child be properly equipped with at least the minimum essentials of the language before the time when he enters the first grade of formal instruction. The present study suggests that further research might well indicate the relative responsibility of the school and the child in the observed inferiority of the bilingual child when he has been measured in terms of experiences which the school should make as common to him as they were to the children upon whom the norms of the measures were based.

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## MENTAL CONFLICTS OF EURASIAN ADOLESCENTS

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In Malaysia there have been European contacts with the native peoples since the early exploration days of the Portuguese and, as a consequence, there is today a hybrid population of about fifteen thousand "Eurasians" in British Malaya alone. They are of a variety of mixtures—the more common type being Portuguese-Malay. Other mixtures are those of the Dutch, British, and Americans with the Malays, Indians, Javanese, and Chinese.

In the early colonizing days when only young unmarried men were sent out there seemed to be no expressed attitude toward mixed marriages or concubinage. Eurasians were looked upon as a "natural result" of the conditions under which "empire builders" were forced to live. At a much

later date the wives and daughters of the government officials and civil service employees came out to the Colonies and thus a European society was established.

Mixed marriages then began to be looked upon as contrary to tradition and Eurasians became an "ever-present reminder that taboos have been violated and caste integrity threatened." These Eurasians are generally so marked physically as to set them off from both parents, and, being excluded from either full-blood group, they constitute a third distinct class. They have not as yet come to feel kinship with one another to such a degree as to be conscious of themselves as a social group. They are a people fighting individually, but never as a group, their own way through race prejudice and social pressure to some kind of a self-respecting social existence. Consequently there are problems in social adjustment that are peculiar to them alone. The Eurasians of Malaysia are being forced by their social conflicts into a kind of a socio-psychological mold out of which they come pathetically cramped in their personality development and with a "mental set" toward their environment which is making proper mental adjustment exceedingly difficult. Obviously, these mental conflicts grow in severity as the Eurasian comes to adolescent age and beyond. Adolescence is the time when the conflict with the environment begins to become a struggle between an *individual* and his environment.

One of the great tragedies to the Eurasian personality is the fact that the struggle to adjust himself to his environment results in the capitulation of his "ego." The "inferior ego" is a most significant problem for the Eurasian adolescent. Hygienic mental adjustment begins at the point where the adolescent is learning the hard lesson that other individuals besides himself exist and have rights similar to his own. But mental maladjustment begins at that point where he is constantly forced to confess that he is markedly inferior to others in those items of personality on which he has come to place high values in the constitution of "self." The adolescent of any race or society tends to place a high value on his "ego," and at this period of life he is beginning to attach personal motives, purposes, and meanings to "self." The undertones of a mental conflict begin in the Eurasian adolescent when he catches the significance of the fact that, because of an incident of birth, it is impossible for him to reach those standards which the inexorable full-blood societies have established. He tends to avoid anything which will in any way degrade his ego. He is, therefore, sensitive about the use of the term "Eurasian" by a member of a full-blood group in describing him. He prefers such terms as "colonial" or "domiciled European." He is exceedingly sensitive and easily hurt, which makes social communication with him difficult. In conversation with Europeans he is likely to imagine unintentional remarks to be levelled at

him. He often presents a kind of "closed personality," an "Eurasian shyness," in the presence of European society. Eurasians are, generally as a group, ostentatious in dress, wearing extreme styles and appearing "over-dressed" at almost any type of social gathering. Upon observation this seems to be an attempt to attract attention.

Another problem of the Eurasian adolescent may be described as the "impoverished self." Psychologically as well as socially they belong to no group. Their conception of themselves is not as a race or a society, and this failure to be "identified," or to be "differentiated," of being a kind of an unknown quantity in the social equation, constitutes a critical factor in this type of mental conflict for the Eurasian adolescent. After all, the individual "self" is intimately related to group membership. Sentiments of love, hate, loyalties, and beliefs are some of the valuable components of "self" which give content and stability to it. But it is the group, not the individual, which develops the body of folklore and tradition, the beliefs and prejudices to which the individual members confess their loyalties. All this is denied the Eurasian adolescent and the richness of his "self" is greatly reduced. As a result there is an Eurasian personality which is, on the whole, more irresponsible and less dependable than that of full-blood groups. In keeping social appointments and to some extent business appointments and in sharing duties with fellow workers there is a noticeable lack of reliability. Eurasians are generally less firm and secure in character traits.

A problem which is considerably accentuated for the Eurasian is that of mating. While there is more or less mating between Eurasians themselves, there is a considerable amount of mating between the more attractive Eurasian girls and European men. Such practice, however, is frowned upon by the European group and in most cases European men with Eurasian wives are not accepted in society. Nevertheless, there seems to be a particularly keen desire on the part of the Eurasian girls to marry white men. Matrons of Y. W. C. A. hostels and directors of Girls' Guilds testify to the eager efforts of these girls to mate with Europeans.

A very appealing factor stimulating the desire of Eurasian girls to marry white men is the improved conditions of family life in the European society as compared with that in the native society. Women live on a much higher plane and the attitude toward wives and mothers is much more desirable than that which the Eurasian girls see in the Old World society, which has not yet given up all of its old traditions, even in the most advanced communities. Eurasian men have not yet fully adopted the philosophy and technique of Western family life. They are learning by observation.

The majority of the higher-class Europeans do not dare to prejudice

their chances of social and business success by marrying even the most attractive of the Eurasian girls, so they will have little or nothing to do with them. Only those who have less to lose are inclined to mate with the mixed bloods. Thus these girls are limited in their choice of a full-blood husband to not only the lower class socially but also to the lower class economically. There are exceptions of course.

The case of Miss C. is interesting here because she is an Eurasian (British-Malay) who did not wish to marry a white man at all. She said she would rather marry a good Malay than a low-class Englishman. Her father, though he had married a Malay woman, and thus brought into the world his Eurasian daughter, insisted on the girl marrying only a European. Miss C. wanted to marry a very high-class Malay who had offered marriage to her. Both the father of the girl and the parents of the young man objected and the young man was called back to his home on a neighboring island. Neither the man nor the girl is yet married.

The attitude of Miss A. is typical. She is an attractive Eurasian of about twenty years of age. She returned after a period of study in England, where, as is usually the case, she had been accepted without question by her school-girl friends. On her return to Malaya she spurned the attentions of the young Eurasian men but eagerly cultivated the friendship of the white men of the city. They, however, soon realized that she was of mixed blood and stopped showing any interest in her. She was very much hurt and unhappy. She confided in a young American woman, who advised her to turn her attention toward the young Eurasian men since she herself was an Eurasian and many of the young men like her were exceedingly worthy. But Miss A. had always thought of marrying a white man and insisted that she would "never marry an Eurasian." At the end of the year she had grown hard and bitter toward life in general. A few months ago, however, she stated in a letter that she had finally come to see the situation in another light and that she was at that time keeping company with a fine Eurasian. This conflict arising out of the problem of mating again adds to the difficulty of the Eurasian in finding an "abundant self." The tendency is to undermine the ego of the Eurasian by flashing before his vision one more of the many evidences of the Eurasian inferiority.

There is another mental conflict arising not so much out of social adjustments but out of parental relationship, and one which is the cause of a great deal of emotional disturbance. It arises out of the Eurasian's doubt of his own parentage and a belief that he has been deceived by his parents. Extra-marital relations with native women were common in the early days and even now flourish, especially in the more remote stations.



Consequently Eurasians learn that they are the offspring of a sort of concubinage relationship between their parents. Father left years ago and probably has not been heard of since. Then there are cases where the father has returned to the colony with a white wife and lives in the same city or district where his Eurasian sons or daughters live. Sometimes this becomes known to the Eurasian offspring.

Miss D. is a beautiful Eurasian girl, the secretary to the principal of a large school. Her mother is Chinese, her father British. She had never seen her father and believed him to be dead. However, he had returned to England to live. When Miss D. was in her teens she learned that her father had married an English woman and had no intention of returning to his "family" in the East. Now she and the other children are supporting themselves and their mother, to whom they are devoted. In relating her story she said that at first she was extremely sorry, hurt, and ashamed about her father, but later she grew to hate him and refused to consider him as her father at all. She says that she has no father. Even in the face of this experience with her own father, Miss D. now in her twenty-fourth year, refused to marry a splendid young Eurasian man and insists that she will marry none but a white man.

Cases like this can be multiplied by the score. Mr. X. is one of the high government officials in Borneo. He has three Eurasian sons of pre-adolescent age in a boarding-school on another island nearby. Their Chinese mother is dead. One day Mr. X. said to the principal of the boarding school, "I dread for the time to come when my boys will grow up to the age of inquiring into and understanding how they came into the world as Eurasians."

Very often in Eurasian families of two or more children it happens that at least one of them resembles in physical features more the native racial stock than any of the others. That is to say, he or she is more a native than a European in appearance. Such children are very often, more often than not, chided and looked down upon by others of the family. Mrs. R., an Anglo-Indian, had two daughters. The British father was dead. One of the daughters was very fair, the other quite dark. The favors were all shown to the fair girl. She was the one present with her mother when callers came. The other girl was called "Blackie" by her mother and kept in the background in spite of the fact that she is the more beautiful and accomplished of the two. "Blackie" was most unhappy and her mental adjustment was severe.

The Eurasian in general is an unadjusted person. He is probably having mental conflicts more severe than a casual observer calculates. It is at best exceedingly difficult to get behind these mental conflicts because of the Eurasian's "closed" personality and extreme shyness. His happy adjust-



ment, however, points not toward identification with any full-blood group but in the direction of a social conception in his own group, and in the common experience of this group there will be built up the ideals, standards, and mores of behavior which will not only give content but anchorage to his "self."

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## THE EMERGENCE OF THE CONCEPT OF PERSONALITY IN A STUDY OF CULTURES<sup>1</sup>

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Our natural interest in human behavior seems always to vacillate between what is imputed to the culture of the group as a whole and what is imputed to the psychic organization of the individual himself. These two poles of our interest in behavior do not necessarily make use of different materials; it is merely that the locus of reference is different in the two cases. Under familiar circumstances and with familiar people, the locus of reference of our interest is likely to be the individual. In unfamiliar types of behavior, such as running a dynamo, or with individuals who do not readily fit into the normal contexts of social habit, say a visiting Chinese mandarin, the interest tends to discharge itself into formulations which are cultural rather than personal in character. If I see my little son playing marbles I do not, as a rule, wish to have light thrown on how the game is played. Nearly everything that I observe tends to be interpreted as a contribution to the understanding of the child's personality. He is bold or timid, alert or easily confused, a good sport or a bad sport when he loses, and so on. The game of marbles, in short, is merely an excuse, as it were, for the unfolding of various facts or theories about a particular individual's psychic constitution. But when I see a skilled laborer oiling a dynamo, or a polished mandarin seating himself at the dinner table in the capacity of academic guest, it is almost inevitable that my observations take the form of ethnographic field notes, the net result of which is likely to be facts or theories about such cultural patterns as the running of a dynamo or Chinese manners.

Ordinarily one's interest is not so sharply defined. It tingles with both personal and cultural implications. There is no awareness of the constantly shifting direction of interest. Moreover, there is much of that confusion which attends all experience in its initial stages in childhood, when the significant personality is interpreted as an institution and every cultural pattern is merely a memory of what this or that person has

<sup>1</sup>Based on a paper presented to the National Research Council Conference on Studies in Child Development at Chicago on June 22, 1933. See also (1).

actually done. Now and then, it is true, there arises in the flow of adult experience a certain intuition of what would be the significant eventual formulation, personal or cultural, of a given fragment of behavior. "Yes, that is just like John," or "But we mustn't make too much of this trifle. Presumably all Chinamen do the same thing under the circumstances," are illustrative symbols for contrasting interpretations. Naturally the confusion of interests is not merely one of the mingling of directions but also of an actual transposition or inversion. A stubbornly individual variation may be misinterpreted as a cultural datum. This sort of thing is likely to happen when we learn a foreign language from a single individual and are not in a position to distinguish between what is characteristic of the language and what is peculiar to the teacher's speech. More often, perhaps, the cultural pattern, when significantly presented in experience, tends to allocate to itself a far too intimate meaning. Qualities of charm or quaintness, for instance, are notoriously dangerous in this regard and tend to be not so much personal as cultural data, which receive their especial contextual value from the inability of the observer to withhold a strictly personal interpretation.

What is the genesis of our duality of interest in the facts of behavior? Why is it necessary to discover the contrast, real or fictitious, between culture and personality, or, to speak more accurately, between a segment of behavior seen as cultural pattern and a segment of behavior interpreted as having a person-defining value? Why cannot our interest in behavior maintain the undifferentiated character which it possessed in early childhood? The answer, presumably, is that each type of interest is necessary for the psychic preservation of the individual in an environment which experience makes increasingly complex and unassimilable on its own simple terms. The interests connoted by the terms culture and personality are necessary for intelligent and helpful growth because each is based on a distinctive kind of imaginative participation by the observer in the life around him. The observer may dramatize such behavior as he takes note of in terms of a set of values, a conscience which is beyond self and to which he must conform, actually or imaginatively, if he is to preserve his place in the world of authority or impersonal social necessity. Or, on the other hand, he may feel the behavior as self-expressive, as defining the reality of individual consciousness against the mass of environing social determinants. Observations coming within the framework of the former of these two kinds of participation constitute our knowledge of culture. Those which come within the framework of the latter constitute our knowledge of personality. One is as subjective or objective as the other, for both are essentially modes of projection of personal experience into the analysis of social phenomena. Culture may be psychoanalytically rein-

terpreted as the supposedly impersonal aspect of those values and definitions which come to the child with the irresistible authority of the father, mother, or other individuals of their class. The child does not feel itself to be contributing to culture through his personal interaction but is the passive recipient of values which lie completely beyond his control and which have a necessity and excellence that he dare not question. We may therefore venture to surmise that one's earliest configurations of experience have more of the character of what is later to be rationalized as culture than of what the psychologist is likely to abstract as personality. We have all had the disillusioning experience of revising our father and mother images down from the institutional plane to the purely personal one. The discovery of the world of personality is apparently dependent upon the ability of the individual to become aware of and to attach value to his resistances to authority. It could probably be shown that naturally conservative people find it difficult to take personality valuations seriously, while temperamental radicals tend to be impatient with a purely cultural analysis of human behavior.

It may be questioned whether a dichotomy which seems to depend so largely on the direction of one's interest in observed behavior can be an altogether safe guide to the study of behavior in social situations. The motivations of these contrasting directions of interest are unconscious, to be sure, yet simple enough, as all profound motivations must be. The study of culture as such, which may be called sociology or anthropology, has a deep and unacknowledged root in the desire to lose oneself safely in the historically determined patterns of behavior. The motive for the study of personality, which we may term indifferently social psychology or psychiatry, proceeds from the necessity which the ego feels to assert itself significantly. Both the cultural disciplines and the psychological disciplines are careful to maintain objective ideals, but it should not be difficult to see that neither the cultural pattern as such nor the personality as such, abstracted as both of these are from the directly given facts of experience, can, in the long run, escape from the peculiarly subtle subjectivism which is implicit in the definitions of the disciplines themselves. As preliminary disciplines, whose main purpose is to amass and critically sift data and help us to phrase significant problems of human behavior, they are of course invaluable. But sooner or later their obscure opposition of spirit must be transcended for an objectivity which is not merely formal and non-evaluative but which boldly essays to bring every cultural pattern back to the living context from which it has been abstracted in the first place and, in parallel fashion, to bring every fact of personality formation back to its social matrix. The problems herewith suggested are, of course, neither simple nor easy. The social psychology into which the conventional cul-



tural and psychological disciplines must eventually be resolved is related to these paradigmatic studies as an investigation into living speech is related to grammar. I think few cultural disciplines are as exact, as rigorously configured, as self-contained as grammar, but if it is desired to have grammar contribute a significant share to our understanding of human behavior, its definitions, meanings and classifications must be capable of a significant restatement in terms of a social psychology which transcends the best that we have yet been able to offer in this perilous field of investigation. What applies to grammar applies no less significantly, of course, to the study of social organization, religion, art, mythology, technology, or any segment, large or small, or groups of segments which convenience or tradition leads us to carve out of the actual contexts of human behavior.

There is a very real hurt done our understanding of culture when we systematically ignore the individual and his types of interrelationship with other individuals. It is no exaggeration to say that cultural analysis as ordinarily made is not a study of behavior at all but is essentially the orderly description, without evaluation or, at best, with certain implicit evaluations, of a behavior to be hereinafter defined but which, in the normal case is not, perhaps cannot be, defined. Culture, as it is ordinarily constructed by the anthropologist, is a more or less mechanical sum of the more striking or picturesque generalized patterns of behavior which he has either abstracted for himself out of the sum total of his observations or has had abstracted for him by his informants in verbal communication. Such a "culture," because generally constructed of unfamiliar terms, has an almost unavoidable picturesqueness about it, which suggests a vitality which it does not, as a matter of scrupulous psychological fact, embody. The cultures so carefully described in our ethnological and sociological monographs are not, and cannot be, the truly objective entities they claim to be. No matter how accurate their individual itemization, their integrations into suggested structures are uniformly fallacious and unreal. This cannot be helped so long as we confine ourselves to the procedures recognized as sound by orthodox ethnology. If we make the test of imputing the contents of an ethnological monograph to a known individual in the community which it describes, we would inevitably be led to discover that, while every single statement in it may, in the favorable case, be recognized as holding true in some sense, the complex of patterns as described cannot, without considerable absurdity, be interpreted as a significant configuration of experience, both actual and potential, in the life of the person appealed to. Cultures, as ordinarily dealt with, are merely abstracted configurations of idea and action patterns, which have endlessly different meanings for the various individuals in the group and which, if they are to build up into any kind of significant psychic structure, whether for the individual or the



small group or the larger group, must be set in relation to each other in a complex configuration of evaluations, inclusive and exclusive implications, priorities, and potentialities of realization which cannot be discovered from an inquiry into the described patterns.

The more fully one tries to understand a culture, the more it seems to take on the characteristics of a personality organization. Patterns first present themselves according to a purely formalized and logically developed scheme. More careful explorations invariably reveal the fact that numerous threads of symbolism or implication connect patterns or parts of patterns with others of an entirely different formal aspect. Behind the simple diagrammatic forms of culture is concealed a peculiar network of relationships, which, in their totality, carve out entirely new forms that stand in no simple relation to the obvious cultural table of contents. Thus, a word, a gesture, a genealogy, a type of religious belief may unexpectedly join hands in a common symbolism of status definition. If it were the aim of the study of culture merely to list and describe comprehensively the vast number of supposedly self-contained patterns of behavior which are handed on from generation to generation by social processes, such an inquiry as we have suggested into the more intimate structure of culture would hardly be necessary. Trouble arises only when the formulations of the culture student are requisitioned without revision or criticism for an understanding of the most significant aspects of human behavior. When this is done, insoluble difficulties necessarily appear, for behavior is not a recomposition of abstracted patterns, each of which can be more or less successfully studied as a historically continuous and geographically distributed entity in itself, but the very matrix out of which the abstractions have been made in the first place. All this means, of course, that if we are justified in speaking of the growth of culture at all, it must be in the spirit, not of a composite history made up of the private histories of particular patterns, but in the spirit of the development of a personality. The complete, impersonalized "culture" of the anthropologist can really be little more than an assembly or mass of loosely overlapping idea and action systems which, through verbal habit, can be made to assume the appearance of a closed system of behavior. What tends to be forgotten is that the functioning of such a system, if it can be said to have any ascertainable function at all, is due to the specific functionings and interplays of the idea and action systems which have actually grown up in the minds of given individuals. In spite of the oft asserted impersonality of culture, the humble truth remains that vast reaches of culture, far from being in any real sense "carried" by a community or a group as such, are discoverable only as the peculiar property of certain individuals, who cannot but give these cultural goods the impress of their own personality. With the disap-

pearance of such key individuals, the tight, "objectified" culture loosens up at once and is eventually seen to be a convenient fiction of thought.

When the cultural anthropologist has finished his necessary preliminary researches into the overt forms of culture and has gained for them an objectivity of reference by working out their forms, time sequences and geographical distribution, there emerges for him the more difficult and significant task of interpreting the culture which he has isolated and defined in terms of its relevance for the understanding of the personalities of the very individuals from whom he has obtained his information. As he changes his informant, his culture necessarily changes. There is no reason why the culturalist should be afraid of the concept of personality, which must not, however, be thought of, as one inevitably does at the beginning of his thinking, as a mysterious entity resisting the historically given culture but rather as a distinctive configuration of experience which tends always to form a psychologically significant unit and which, as it accretes more and more symbols to itself, creates finally that cultural microcosm of which official "culture" is little more than a metaphorically and mechanically expanded copy. The application of the point of view which is natural in the study of the genesis of personality to the problem of culture cannot but force a revaluation of the materials of culture itself. Many problems which are now in the forefront of investigation sink into a secondary position and patterns of behavior which seem so obvious or universal as not to be worthy of the distinctive attention of the ethnologist leap into a new and unexpected importance. The ethnologist may some day have to face the uncomfortable predicament of inquiring into such humble facts as whether the father is in the habit of acting as indulgent guide or as disciplinarian to his son and of regarding the problem of the child's membership inside or outside of his father's clan as a relatively subsidiary question. In short, the application of the personality point of view tends to minimize the bizarre or exotic in alien cultures and to reveal to us more and more clearly the broad human base on which all culture has developed. The profound commonplace that all culture starts from the needs of a common humanity is believed in by all anthropologists, but it is not demonstrated by their writings.

An excellent test of the fruitfulness of the study of culture in close conjunction with a study of personality would be provided by studies in the field of child development. It is strange how little ethnology has concerned itself with the intimate genetic problem of the acquirement of culture by the child. In the current language of ethnology culture dynamics seems to be almost entirely a matter of adult definition and adult transmission from generation to generation and from group to group. The humble child, who is laboriously orienting himself in the world of his society, yet is not, in

the normal case, sacrificing his forthright psychological status as a significant ego, is somehow left out of account. This strange omission is obviously due to the fact that anthropology has allowed itself to be victimized by a convenient but dangerous metaphor. This metaphor is always persuading us that culture is a neatly packed-up assemblage of forms of behavior handed over piece-meal, but without serious breakage, to the passively inquiring child. I have come to feel that it is precisely the supposed "givenness" of culture that is the most serious obstacle to our real understanding of the nature of culture and cultural change and of their relationship to individual personality. Culture is not, as a matter of sober fact, a "given" at all. It is so only by a polite convention of speech. As soon as we set ourselves at the vantage point of the culture-acquiring child, the personality definitions and potentials that must never for a moment be lost sight of, and which are destined from the very beginning to interpret, evaluate and modify every culture pattern, sub-pattern, or assemblage of patterns that it will ever be influenced by, everything changes. Culture is then not something given but something to be gradually and gropingly discovered. We then see at once that elements of culture that come well within the horizon of awareness of one individual are entirely absent in another individual's landscape. This is an important fact, systematically ignored by the cultural anthropologist. It may be proper for the systematic ethnologist to ignore such pattern differences as these, but for the theoretical anthropologist, who wishes to place culture in a general view of human behavior, such an oversight is inexcusable. Furthermore, it is obvious that the child will unconsciously accept the various elements of culture with entirely different meanings, according to the biographical conditions that attend their introduction to him. It may, and undoubtedly does, make a profound difference whether a religious ritual comes with the sternness of the father's authority or with the somewhat playful indulgence of the mother's brother. We have not the privilege of assuming that it is an irrelevant matter how musical stimuli are introduced to the child. The fact that the older brother is already an admired pianist in the little household may act as an effective barrier to the development of interest in any form of musical expression. Such a child may grow up curiously obtuse to musical values and may be persuaded to think that he was born with a naturally poor ear and is therefore debarred from sharing in the blessings of one important aspect of the cultural life of the community.

If we take the purely genetic point of view, all the problems which appear in the study of culture reappear with a startling freshness which cannot but mean much for the rephrasing of these problems. Problems of symbolism, of superordination and subordination of patterns, of relative strength of emotional character, of transformability and transmissibility, of

the isolability of certain patterns into relatively closed systems, and numerous others of like dynamic nature, emerge at once. We cannot answer any of them in the abstract. All of them demand patient investigation and the answers are almost certain to be multiform. We may suggest as a difficult but crucial problem of investigation the following: Study the child minutely and carefully from birth until, say, the age of ten with a view to seeing the order in which cultural patterns and parts of patterns appear in his psychic world; study the relevance of these patterns for the development of his personality; and, at the end of the suggested period, see how much of the total official culture of the group can be said to have a significant existence for him. Moreover, what degree of systematization, conscious or unconscious, in the complicating patterns and symbolisms of culture will have been reached by this child? This is a difficult problem, to be sure, but it is not an impossible one. Sooner or later it will have to be attacked by the genetic psychologists. I venture to predict that the concept of culture which will then emerge, fragmentary and confused as it will undoubtedly be, will turn out to have a tougher, more vital, importance for social thinking than the tidy tables of contents attached to this or that group which we have been in the habit of calling "cultures."

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## THE INFLUENCE OF STUTTERING ON THE ATTITUDES AND ADAPTATIONS OF THE STUTTERER

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Many workers in the field of speech pathology have expressed in various ways the theory that emotional and social maladjustments are important factors in connection with stuttering. It has been thought that emotional and social maladjustments not only aggravate stuttering, but also that they cause it in the first place.

Now, it is obvious that before we can say definitely that the stutterer's speech disorder is due to his emotional and social maladjustment we must be sure of at least two things: First, we must be sure that the stutterer is maladjusted; and, if so, in what respect and to what degree. Second, we must be sure whether this maladjustment is in any degree the result of the speech disorder. That is, does the individual stutter because he is maladjusted, or is he maladjusted because he stutters?



This problem was attacked by investigation of the influence of stuttering on the attitudes and adaptations of the stutterer, in so far as those attitudes and adaptations could be identified. The investigation has been reported at length and in detail elsewhere (2). The present report is very much condensed and abridged.

The method used was essentially that of functional analysis, carried out by means of case studies. The stutterer was regarded as an individual with social relationships, the individual and his social relationships constituting a unit. By controlling pertinent conditions as well as possible, the attempt was made to ascertain the kinds and degrees of influence which stuttering exerts upon this unit. If the stutterer and his social relationships be designated as *A*, and stuttering as *B*, then it may be said that an attempt was made to explain *A* in terms of *B*.

Many specific techniques were used to obtain information concerning the stutterer's attitudes and adaptations and the relationship of his stuttering to them. In the first place, almost every subject was examined routinely in the State University of Iowa Speech Clinic. The routine examination involves the taking of a rather thorough case history; intelligence test; a battery of motor lead tests; and special neurological, physical, medical, psychiatric, and speech examinations (5). The examination is administered in whole or in part to every case passing through the clinic.

In addition to this routine examination, the Woodworth-House Mental Hygiene Inventory was used. Thirty-four stutterers wrote their autobiographies; these ranged in length from about 1000 to 15,000 words. Questionnaires were filled out by stutterers and by their parents and teachers. Hundreds of hours were spent in interviewing stutterers, parents, and teachers. One voluminous diary, numerous introspections, accounts of day-dreams, elaborations of responses to the Woodworth-House Mental Hygiene Inventory, short stories, essays, poems, and plays written by the stutterers, school and vocational records, and other personal documents were examined.

A rating scale was used to classify most of the subjects on the basis of severity of stuttering. Three classes were used: mild, moderate, and severe stuttering.

Eighty stutterers served as subjects. These ranged in age from 7 to 42 years, the average age being 19.2 years. Sixty-one were male and 19 were female. There was a greater proportion of severe cases among the boys than among the girls in this study.

Of the 80 stutterers, 42 were college and university students or graduates, 17 were high-school students or graduates, and 21 were elementary-school pupils or eighth-grade graduates. Thirty-six Otis and eight Stanford-



Binet mental test scores showed a range in IQ from 83 to 136, with an average of 109.5 (S.D., 13.790).

Investigation was made of the stutterer's problem in connection with oral recitation and scholastic progress. The influence of stuttering is to be seen most clearly in the following findings and conclusions: Of 57 stutterers approximately 70% were dissatisfied with policies that compelled them to recite orally as much as non-stutterers. Nevertheless, all but one had always or at various times been compelled to recite on a common basis with the non-stuttering pupils. Four stutterers left school before completing their scholastic plans, chiefly because oral recitation, from which they were not excused, was intolerable to them. Of special interest is one girl who made her only low grade under a teacher who demanded that she recite as much as the other pupils did. There were many examples of extreme unhappiness and discouragement occasioned by the necessity of meeting routine oral assignments. An examination of all the data suggests the recommendation that the stuttering pupil be allowed to recite orally whenever he volunteers to do so, but that he not be called upon to recite if he does not volunteer; and that he be asked to do extra written work in proportion to the degree to which he is excused from oral work. The nature of this recommendation implies what the data indicated, that routine oral recitation is a source of keen humiliation, discouragement, and even scholastic failure for many stutterers. This is to be interpreted as an indication that many of the stutterer's undesirable attitudes and adaptations in school are to be regarded as his reactions to the handicapping and humiliating influence of his speaking disability.

An investigation of the stutterer's scholastic progress and factors affecting it led to the conclusion that the following factors were chiefly responsible for such scholastic failure as the stutterers reported: (1) difficulty in oral recitation, with which is closely associated lack of interest and lack of industry in certain courses; (2) unfortunate policies used by teachers, regarded as unfair by the stutterer and consequently conducive to lack of interest and industry; (3) apparent lack of ability in certain courses; and (4) absence from school due to illness. And the one factor most responsible, directly or indirectly, for scholastic difficulty among stutterers was shown to be quite unmistakably the handicapping and humiliating influence of stuttering.

In examining the vocations, ambitions, and major fields of study of stutterers, the influence of stuttering is to be seen in a striking way. Average and severe stutterers are strongly inclined to prefer vocations, ambitions, and major fields of study which demand relatively little speaking. This is not so generally true of mild stutterers. There tends to be considerable agreement between the nature of vocations and ambitions and

major fields of study. Exceptions to this rule, that is, disagreement between vocation and ambition or between ambition and major field of study, represent in large measure vocational maladjustment. And in this maladjustment stuttering plays a considerable part. It is very significant that most stutterers, with the exception of many mild cases, achieve or at least attempt vocational adjustment in rather a negative manner, that is, by favoring those vocations which make small demands upon speech and by avoiding those which require normal, fluent speech. There can be little doubt that this tendency serves to curtail both earning power and self-expression by limiting the field of vocational endeavor.

In general, mild stuttering is not a serious vocational handicap. Exceptions to this general rule are found among those stutterers who regard even slight disability in speaking as a serious handicap and a mark of grave inferiority, and who consequently limit themselves to occupations requiring very little talking.

Severe stuttering is a serious vocational handicap for all practical purposes. The severe stutterer is especially liable to discontent whenever his occupation does not agree with his ambition. The most precise conclusion that can be drawn is that, when severe stuttering is a vocational handicap, it is so relative to social conditions and relative to the stutterer's manner of interpreting those social conditions in relation to his speaking disability. It is to be understood that this statement serves to explain, but not to deny, that severe stuttering is a vocational handicap.

Suffice it to say that average stutterers occupy in these matters largely the middle ground. It is most significant that the vocational attitudes and adaptations of stutterers, whether mild, average, or severe, are in considerable degree their reactions toward their own stuttering and its implication.

On the basis of the Woodworth-House Mental Hygiene Inventory, 50 stutterers were compared with the 400 normal male subjects and the 50 psychoneurotic male subjects reported by House (1). The average age of the stutterers was 21.5 years; that of House's normals was 19.5 years; and that of House's psychoneurotics was 32.5 years. Of the stutterers, 39 were male and 11 were female. Ten stutterers elaborated their responses to the inventory in an effort to identify the relation of stuttering to their problems.<sup>1</sup>

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<sup>1</sup>A detailed presentation of the data is to be found in Johnson (2, pp. 77-93).

It is necessary to point out that the Woodworth-House Mental Hygiene Inventory consists of 100 statements of personality problems. The subject can check one of three answers: problem extreme, problem moderate, problem does not exist. Thirty of the items refer to childhood, answers applying to the period up to age 14 years; a separate score is based on

Mean scores do not indicate any significant difference between stutterers and normal non-stutterers, either in childhood or maturity. The scant difference between the two groups in childhood corroborates the findings of McDowell (4). She found no important difference between the emotional adjustments of stuttering children and those of non-stuttering children.

As a group, stutterers represent relatively normal adjustment, according to the inventory responses. This statement is to be qualified and refined by the following considerations: In maturity the stutterers had significantly more extreme problems than did the normal non-stutterers; they had significantly less extreme problems than did the psychoneurotics. Apparently stuttering becomes, with increasing age, a greater and greater burden with which non-stutterers do not have to contend, but which renders the adjustments of stutterers more difficult. Even with this added burden, however, stutterers adjust with much less extreme difficulty than do psychoneurotics.

If a score of 35 or higher on the Maturity items be taken to indicate critical psychoneurotic involvement (1), then an insignificantly larger proportion of stutterers than of non-stutterers show such involvement. And stutterers are decisively less psychopathic than are avowed psychoneurotics on such a basis. Specifically, the personality problems of stutterers, more so than those of normal non-stutterers and less so than those of psychoneurotics, are featured by shyness, anxiety, depression, and nervous instability.

In general, stutterers report that their speaking disability is responsible chiefly or largely for over half of their personality problems as checked in the inventory. They report that it is not responsible in any important sense for about 30% of their problems. They are unable to identify the part played by stuttering in about 13% of their problems. The sense of inferiority, stressed by many speech workers as one of the prime causes of stuttering, was reported by ten stutterers as being due chiefly to the frustrating and humiliating influence of stuttering. The same statement, essentially, is to be made concerning shyness, seclusiveness, moodiness, anxiety, and depression. The reports of these stutterers did indicate that stuttering and maladjustment are parts of a vicious circle; stuttering is conducive to maladjustment, which is conducive apparently to more stuttering, which is conducive to more maladjustment, and so on. This vicious circle has been discussed in detail in *The Influence of Stuttering on the Personality* (2).

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these 30 items. The other 70 items refer to maturity. The answers applying to the period following the fourteenth year; the Maturity score is based on these 70 items. Scores are derived by summing the "extreme" and "moderate" responses.

It is sufficient to point out here the fact that maladjustment may occur without stuttering and that stuttering may occur without maladjustment, which indicates that probably maladjustment is neither a sufficient nor an essential cause of stuttering (3).

The general conclusion to be drawn from the entire investigation is that (1) the emotional and social adjustments of stutterers are on the average and in their general respects relatively normal and (2) such mal-adjusted attitudes and adaptations as the stutterers have are in large measure due to the frustrating and humiliating influence of the speaking disability. This general conclusion is supported not only by those aspects of the investigation that have been touched upon above, but also by an examination of the stutterers' attitudes and adaptations in the home, their extra-curricular and social activities in the school, their foremost wishes, their day-dreams, and their autobiographies; and by a detailed study of individuals who have known relatively long periods of both normal speech and stuttering.

Finally, the results of this study place the burden of proof upon those who contend that stutterers exhibit considerable emotional and social maladjustment, and that this maladjustment is the essential and sufficient cause of stuttering. And the findings here reported narrow the field from which evidence may be drawn in support of such a contention, because these findings indicate that such emotional and social maladjustment as the stutterer does exhibit is significant largely in the sense that it constitutes his reactions to his disability.<sup>2</sup>

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<sup>2</sup>For a complete account of the investigation reported here, see reference (2) in the appended bibliography.



AN EXPERIMENTAL STUDY OF SOME FACTORS INFLUENCING  
THE SOCIAL ATTITUDES OF COLLEGE STUDENTS

C. W. TELFORD

## EDUCATIONAL DETERMINANTS OF SOCIAL ATTITUDES

One of the avowed purposes of education is the development of ideals and attitudes. These are often mentioned as the most intangible and immeasurable as well as the most important outcomes of our educational procedures. Recently some success has been attained in constructing devices which make possible some sort of quantitative measurement along these lines. One of the most notable of these successes is Thurstone's construction of scales for the measurement of social attitudes. Certain of these scales were the measuring devices used in the present study.

The present project was undertaken with the purpose of determining to what extent a semester's training in certain courses at the University of North Dakota has made measurable changes in the avowed attitudes of the students. For this purpose, the attitude toward the treatment of criminals was the one selected for study.

The plan was to have the subjects fill in certain schedules intended to reveal their attitudes toward the treatment of criminals, which might conceivably be changed by course work in the University. The schedules were to be filled in before and after taking the courses. If the course work had any effect on the attitude under consideration it might be revealed by changes in the scores on the schedules filled in before and after taking the course.<sup>1</sup>

The courses chosen were General Psychology, Educational Psychology, Introductory Sociology, and Criminology. Form A of the Wang and Thurstone scale for measuring attitude toward the treatment of criminals (scale No. 9) was given during the week of February 17, 1932, and a repeat test, Form B of the same scale, was administered to the same subjects during the week of May 24, 1932. The first test was thus given at the beginning of the second semester of the school year 1931-32, and the repeat test at the end of the same semester. Form A was also administered to the members of the Business and Professional Women's Club of Grand Forks at one of their regular meetings. Comparisons are made between this group and the college groups used in the main experiment. The results obtained are presented in Table 1.

These data show that the initial medians of the four groups do not differ greatly, while the differences between the several pairs of medians of Form B are somewhat larger. This indicates differential effects of the four

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<sup>1</sup>Miss Margaret Kaulbarsch is responsible for most of the data presented in this section of the study.



TABLE 1  
CHANGES IN ATTITUDE SCORES INCIDENT TO A SEMESTER'S TRAINING IN VARIOUS COLLEGE COURSES

Group	N	Medians Form A	Medians Form B	Differences between medians of forms A and B
General Psychology	21	5.63	5.32	.31±.19
Educational Psychology	44	5.58	5.22	.46±.13
Introductory Sociology	49	5.78	5.02	.76±.19
Criminology	27	5.61	4.17	1.44±.17
All college students	141	5.77	5.01	.76±.09
Women's B. and P. Club	45	5.74		

courses. It is found that the medians on Form B show a decrease in every group. The differences between the medians also increase in size as we go from General and Educational Psychology to Introductory Sociology and Criminology. These differences are in the expected direction. General Psychology as it is taught at the University of North Dakota deals but little with man's social relationships, and such problems as determinism, free will, responsibility, etc., practically never arise. Consequently, we should expect the materials of the course to influence one's social attitudes very little. Educational Psychology, which is concerned with the application of psychological principles to problems of the classroom, deals more with social interaction and should influence one's social attitudes more directly. Introductory Sociology is concerned immediately with man's social relationships and should show a greater effect. Criminology investigates directly the problem involved in the tests. Note that the difference between the medians of Form A and Form B is twice as large as the corresponding difference for Introductory Sociology. Since the general trend of thinking in Criminology is toward a more sympathetic and humane treatment of criminals, a lowering of the score of Form B from that of Form A is found for every student taking the course.

These results indicate that the regular college courses are bringing about measurable changes in the student's avowed attitudes on social questions. As would be expected, the change is greater in those courses more closely related to the variable under investigation.

It is possible to show these shifts in attitude in another way. Thurstone has suggested a classification of test scores into the following groups: (1) indicating strong opposition to punishment, (2) preferring re-education, (3) a neutral or doubtful group, (4) favoring some punishment, (5) favoring severe punishment. Table 2 shows the scores of the different groups according to this classification. The shift in scores at the end as con-

TABLE 2  
DISTRIBUTION OF SCORES ON ATTITUDE SCALE BEFORE AND AFTER TAKING EACH OF THE COURSES LISTED

Qualitative description of attitude	Score range	General Psychol.		Educ. Psychol.		Intro. Sociol.		Crimin.		All college groups		Women's B. & P.	
		Form A	Form B	Form A	Form B	Form A	Form B	Form A	Form B	Form A	Form B	Form A	Form B
Strongly opposed to punishment													
Preferring re-education	0.0- 3.4	1	0	0	0	0	5	0	5	1	10	0	0
Neutral or doubtful	3.5- 4.9	2	6	7	16	6	19	5	19	20	60	4	4
Favoring some punishment	5.0- 5.9	12	14	27	27	25	21	14	3	77	65	27	27
Favoring severe punishment	6.0- 7.4	4	1	9	1	14	1	7	0	34	3	11	11
	7.5-11.0	2	0	2	0	4	3	1	0	9	3	3	3
Total frequencies		21	21	44	44	49	49	27	27	141	141	45	45

trusted with the beginning of the courses can be seen more in detail in this table.

The most striking feature of the results obtained from the Business and Professional Women's Club is their similarity to the corresponding data from the college groups.

#### CONSISTENCY IN CHECKING STATEMENTS

In scoring the papers the writer noticed that many students checked statements which seemed to be quite contradictory in their imports and which differed widely in their scale values. Individual differences in this respect were rather great. This raised the question as to whether or not any concomitants of this consistency or lack of it could be found. The first relationship which suggested itself was that between the scores on the scale and consistency. As a measure of consistency the average deviation of the scale values of the various statements checked from the mean scale value was computed for each person. Table 3 gives the results of comparing the A.D.'s. and test scores of all the college groups combined.

TABLE 3  
RELATIONSHIP BETWEEN TEST SCORES AND AVERAGE DEVIATIONS OF THE SCALE  
VALUES OF THE CHECKED STATEMENTS FROM THE AVERAGE VALUES

Test score	Number of cases	Median A.D.
8.0	3	1.9
7.5	6	1.9
7.0	8	1.9
6.5	7	2.0
6.0	19	2.1
5.5	42	1.9
5.0	35	2.5
4.5	13	2.6
4.0	3	2.0
3.5	4	1.1
3.0	1	.6
141		

The differences here are neither very great nor very uniform, and the small numbers in the extreme positions make any conclusions hazardous. They do suggest, however, that those persons with rather extreme views are somewhat more consistent in their acceptance or rejection of statements than are those rather neutral in their attitudes.

The next relationship which suggested itself was between intelligence and consistency in checking statements on the attitude scale. Consequently the mean A.D.'s for the persons scoring in each of the five quintiles of the

Thurstone IV Intelligence Test were computed. The results of these calculations are given in Table 4.

TABLE 4

RELATIONSHIP BETWEEN INTELLIGENCE TEST SCORES AND AVERAGE DEVIATIONS OF SCALE VALUES OF INDORSED STATEMENTS

Quintile on intelligence test	Number of cases	Average A.D.
1	26	1.97
2	28	1.96
3	25	1.80
4	23	1.87
5	36	1.85

The anticipated differences are found here in each group except the third quintile, which shows the smallest A.D. (greatest consistency). With this one exception there is a constant increase in consistency with increase in intelligence level. We cannot explain this one reversal in the table but hope to be able to check these results on larger groups later. These data do suggest, however, that consistency in checking statements which represent one's attitude may be positively related to intelligence.

#### DENOMINATIONAL DETERMINANTS OF ATTITUDE TOWARD THE CHURCH

We have applied Thurstone's and Chave's (2) scale for the measurement of attitude toward the church to 219 sophomore students at the University of North Dakota and this section of the study reports the results obtained. The students were all enrolled in the course in General Psychology and probably represent a fair cross-section of the entire student body. Of the 219 students, 30 were Catholics, 172 were Protestants, 8 were Jews, and 9 had no religious affiliations.

The 30 Catholics obtained a median scale value of 1.75,  $Q=.83$ . This may be compared with median scale values of 3.00 and  $Q$  of 1.10 for the entire Protestant group, 6.50 and  $Q$  of 1.10 for the eight Jews, and 6.50 and  $Q$  of .81 for the remaining nine. A low scale value represents an attitude favorable to the church.

Thurstone and Chave (2) report average scale values of 2.90 for 72 Roman Catholics, 3.97 for 463 Protestants, and 5.44 for 176 Jews. All of these were students at the University of Chicago. These results agree with our data in finding that the Roman Catholics are most favorable to the church while the Protestants are considerably less so and the Jews are most antagonistic to the church. The difference between the Catholics and Protestants (University of North Dakota data) is  $1.25 \pm .14$ , between Catholics and Jews  $4.75 \pm .53$ , between Protestants and Jews  $3.50 \pm .55$ ,

between Catholics and those of no religious affiliations  $4.75 \pm .40$ , and between Protestants and those reporting no affiliations  $3.50 \pm .35$ . These results show statistical reliability for all the obtained differences. These data also indicate that students at the University of North Dakota are somewhat more favorably inclined towards the church than are University of Chicago students.

We have also computed the median scores for the members of the different Protestant denominations and find that the 37 Lutherans and 13 Methodists both have median scale values of 2.92, with Q's of .85 and .82; 31 Presbyterians average 3.19, with Q of .99; 14 Congregationalists 3.75, with Q of 1.41; 13 Episcopalians average 3.25, with Q of 1.13; and 3 Baptists 2.63, with Q of .49. The small numbers represented make these comparisons of little value but show the order of denominations from most to least favorable, in our group of students, to be Baptists, Lutherans and Methodists, Presbyterians, Episcopalians, and Congregationalists.

We find the median scale value of those who report active church relations to be 2.06 (90 cases), while those who are nominal members average 3.38 (83 cases), and those with no church relation average 3.85 (43 cases). We find the same expected differences when the median scale values of those attending church regularly, frequently, occasionally, seldom, and not at all are computed. The medians are 1.91 (68 cases), 2.48 (57 cases), 3.50 (58 cases), 4.95 (31 cases), and 6.75 (5 cases) for the five groups, respectively. The differences between these groups are statistically reliable.

Hartshorne and May (1) have shown that parents are the most important persons determining the moral and ethical conceptions and practices of their children. We also know that parental example and attitude are most important in determining the religious affiliations and attitudes of the children. Where the religious conceptions and affiliations of both parents are the same, the probability of the offspring differing very markedly from them in this respect is not very great. It is interesting to speculate as to what happens to the attitudes and affiliations of the children when those of the parents differ.

In the group studied 160 were asked to indicate the religious affiliations of their fathers and mothers. Of these, 41 cases were found where father, mother, and child did not all belong to the same church. Among these 41, there were 24 cases where the religious affiliations of the parents differ and the child belongs to the same church as one of the parents. The median scale value for these 24 is 3.13 with Q of 1.10. This value is a little above the average of the groups from which they come. Five of the 24 are Roman Catholics and the mean scale value for these is 2.43. This is considerably above the average for the Catholic group as a whole. It will be recalled that a low score indicates an attitude favorable to the church. There



are seven cases where the religious affiliations of the parents are the same but that of the child differs. The median value for these seven is 2.75, and  $Q$  is 1.82. The same figure for 10 students from families in which the religious affiliations of father, mother, and child all differ is 4.00, and  $Q$  equals 1.62.

It is interesting to note that of the 24 pupils where the religious affiliations of the child is the same as that of one parent the child belongs to the same church as the mother in 23 of the 24 cases. This indicates that the mother plays a much more dominant rôle in determining the religious affiliations of the child than does the father. It is probable that in other fields, such as politics, the opposite of this may be found.

#### SUMMARY

The data presented in this study indicate that:

1. Students at the University of North Dakota are considerably more favorable toward the church in their expressed attitudes than are students of the University of Chicago.
2. Roman Catholics are more favorable to the church than are Protestants, who in turn are more favorable than are Jews and those with no religious affiliations.
3. Active church membership and regular church attendance are associated with a favorable attitude toward the church.
4. Where father, mother, and child do not all belong to the same church the child is less favorably inclined toward the church than when all have the same church affiliations.
5. The mother plays a more dominant rôle in determining the religious affiliations of the children than does the father.
6. Students taking a regular semester course in Criminology become measurably more humane in their avowed attitudes toward the treatment of criminals during the semester. Students taking Introductory Sociology, Educational Psychology, and General Psychology show slight changes in the same direction, the size of these shifts decreasing in the order listed.
7. Students who are extreme in their attitude toward the treatment of criminals are somewhat more consistent in checking statements which represent their attitudes than are those more neutral in attitude. The data on this point are not entirely satisfactory.
8. Consistency in checking statements which represent one's attitude is positively correlated with intelligence. The evidence on this point is suggestive rather than conclusive.

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## BOOKS

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ROBERT LATOU DICKINSON AND LURA BEAM. *The Single Woman*. Baltimore: Williams & Wilkins, 1934. Pp. xix+469. \$5.

This is the evaluation by the junior author of the files resulting from the senior author's fifty-year gynecological practice, parallel to the treatment of the data for the married published last year under the title *A Thousand Marriages*. It may have been psychologically a little unfortunate to have published these volumes tandem instead of abreast, so to speak; for though there is no obvious difference in quality between the two, one is a little less inclined to be charitable toward the reiteration of the inevitable faults (from the scientific viewpoint) of the method. It is clear that Miss Beam has done a masterly job of imposing an arrangement on the unruly facts—yet the impression cannot but intrude itself through any arrangement that the task was essentially to convert a garret into a museum with educational value, and that such a task is pretty unpromising from the start. It is very hard to say what hypothesis is tested or what generalization suggested, what problem illuminated by this mass of interesting odds and ends. Possibly a case could be made out for the proposition that such material is not scientific in nature, but artistic—that its publication, like the hanging of a picture, merely makes possible the enrichment of the background and experience of the readers; some of the embellishments, in fact—chapter summaries and literary interpolations—seem definitely calculated to yield esthetic effect. One senses throughout the medical as against the scientific point of view.

The material is divided into four main divisions: health, sexuality, creative problems, and interpretation. The high spot of the first is the first chapter, entitled *1895*, which, especially when taken in conjunction with Chapter 16 in Part Four, *1930*, is of considerable socio-historical and psycho-historical interest (not diminished by the frontispiece, from Dr. Dickinson's pencil, portraying in extenso the various items of the feminine armor affected during the former period). Part Two contains a great deal of case-history material, particularly on auto- and heterosexuality, and this may perhaps be regarded as the core of the volume; homosexuality was encountered, but apparently only incidentally—due to the therapeutic necessities no adequate judgment of the real incidence of anything can be formed, even were the population unselected, since if there were no definite therapeutic reason for them questions were not asked. Factually, the generalizations possible here sound trite: most girls satisfy their sexual needs by masturbation; some have coitus and coitus approximations

with men, and a scattering with women. Still, the picture of just what happens, and how, is not without interest at the present stage, since so recently the sexual lives of women were, like the okapi, rare, often supposed to be non-existent, and at most confined to the deeper jungles.

Part Three, containing chapters on family, religion and art, and work, also eventuates in conclusions that are not wholly unexpected: the unmarried have rather an overdose of family fixations; religion, art, and work are sublimations, and sometimes pretty leaky ones, of the normal biological drives. Both doctor and amanuensis lean a bit toward lyricism (as judged by more recent standards) in evaluating religion, virginity, etc., but this is balanced by, if hardly blended with, various statistical comparison data on work.

We should naturally look to Part Four for an indication of what it is all about in the minds of the authors. We find a chapter on "control groups," but it appears that these are simply the fraction of the total files containing no special mention of sexual history; thus the variable under study, sexuality, is "controlled" away, and all that remains to be examined is minor material on health, number of previous doctors, etc. The "1930" female is a considerably more biological animal, it appears, than her mother; she knows what she wants, that there's nothing abnormal about it, and usually how to get it. The summary chapter, like the book, is difficult to evaluate in terms of concrete statements emerging from the data which are not trite; there are a few which seem to represent the free associations of the writer after working with the material, but they bear a rather tenuous relation to the data, e.g., "Changes in the biological fertility of women are inseparable from changes in the economic fertility of men."

This venture begins to seem definitely lower in conception and value than those of Hamilton and Davis; data, no matter how ample, collected with no special hypothesis in mind (possibly the doctor's belief that anatomy documents sex practice is an exception, but this still lacks definite support in the material presented) and from a sub-population selected by criteria irrelevant to almost any conceivable hypothesis, are almost from the beginning doomed to be inferior as scientific material to collections made with a definite purpose and from populations sampled in known ways. But from the esthetic, dramatic, exploratory, human-interest angles it must be conceded that the books have a very respectable educational value.

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# THE OCCUPATIONAL ATTITUDES OF COLLEGE MEN\*

*From the Department of Rural Social Organization of Cornell University*

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W. A. ANDERSON

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In 1926, as the result of an article by Professor George Counts in *The School Review* of January, 1925 (5), the present writer made a study of the occupational attitudes of a group of college men in a southern agricultural and engineering college (2). This study indicated that these college students had acquired from the rural and small town environment in which they lived very definite mental sets toward the occupational world and that these "sets" remained fairly fixed through their college career. Since this study, the writer has revised the method first used and expanded the scope of analysis in another attempt to express quantitatively the existence of occupational attitudes among another group of college men in the same institution. This study makes it possible to compare the results of the two studies to see whether both groups exhibit similar responses to the same set of occupations and to the same degree. The first study measured the attitudes toward the group of occupations solely from the viewpoint of social contribution. In this second analysis, measures of the attitudes toward the occupations from the point of view of economic status and social prestige were introduced and contrasts made between the three measures resulting.

## METHODS OF STUDY

The data were gathered in the classrooms at North Carolina State College of Agriculture and Engineering, in the fall of 1929. The group included in this analysis consists of 673, 44 per cent, of the 1528 male students enrolled. Of these, 211, 31 per cent, were freshmen; 199, 29 per cent, were sophomores; 131, 20 per cent, were juniors; 132, 20 per cent, were seniors. Each student was given a schedule of four pages. Page one consisted of general information, such as year in school, college in which registered, voca-

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tion of the father, vocational choice made, vocational suggestions of parents. After completing these questions the students were instructed to turn to page two, not looking at page three or four. On this page were listed, below the following paragraph of instructions, the 25 occupations in their alphabetical order:

In the following list are twenty-five occupations which you are to arrange in the order of their social standing according to your own judgment. After that occupation which you consider to have the highest social rating, on the basis of its contribution to society, place the number (1); after that which you think should occupy second place in this respect, the number (2); and so on until finally you place 25 after that occupation which you think deserves the lowest *social rating*. You will avoid mistakes if, on a separate sheet of paper, you first arrange the 25 occupations into five groups of five occupations each, putting the five highest in the first group, the next five in the second group, etc. Then you can put the five in each group in their proper order and finally transfer your ranking to the column below.

#### SOCIAL CONTRIBUTION

	Rank
Artist (sculptor, painter, musician)	_____
Banker (part owner, and director in bank)	_____
Barber (works in barber shop)	_____
Baseball Player (professional)	_____
Blacksmith (runs his own shop)	_____
Bookkeeper (works in office)	_____
Carpenter (skilled at house building)	_____
Chauffeur (runs automobile)	_____
Clergyman (minister, pastor, preacher, or priest)	_____
Ditch Digger (works with pick and shovel)	_____
Engineer (civil, mechanical or electrical)	_____
Factory Manager (manages mill but does not own)	_____
Factory Operative (runs machine in factory)	_____
Farmer (owns and operates own farm)	_____
Insurance Agent (sells life insurance)	_____
Lawyer (practices law in court)	_____
Machinist (skilled in repairing and making machines)	_____
Man of Leisure (has income from inherited fortune)	_____
Manufacturer (owner of a textile factory)	_____
Merchant (owns general store of moderate size)	_____

Physician (practices medicine)	_____
Professor (teaches in college or university)	_____
Salesman (represents wholesale company)	_____
School Teacher (in rural or city high school)	_____
Soldier (private in U. S. Army)	_____

An important step in the ranking is stated in the last sentence of the paragraph of instructions. The students could not keep in mind as many as twenty-five occupations in their relative positions at the same time. By ranking them into five groups of five occupations each and then transferring the ranking of each small grouping into their consecutive order from one to twenty-five the danger of confusion was avoided.

After the occupations were ranked on the basis of social contribution, they were instructed to turn to page three and in the same manner as with page two, to rank the 25 occupations consecutively from one to twenty-five upon the basis of the social prestige they thought an individual would be accorded by the social group if he followed the occupation as a life work. Thus the attitude toward the occupation from the viewpoint of social prestige was obtained.

After the occupations were ranked on the basis of social prestige, they were instructed to turn to the next page and, in the same manner as before, rate the same 25 occupations consecutively, from one to twenty-five, upon the basis of the economic return they thought an individual might expect to receive if he followed the occupation as a life work. This rating would give the attitude toward the occupation from the economic viewpoint.

No time limit was set during which the rating was to be completed. Each student was given all the time necessary to complete the task. Most of the students used the 50-minute class period to complete the task.

By the process of ranking, therefore, and the measurement of the central tendencies in these rankings, some indications of the attitudes of these students toward a group of occupations is obtained from the viewpoints of social contribution, economic return, and social prestige.

#### THE OCCUPATIONAL BACKGROUND OF THE GROUP STUDIED

If attitudes are mental sets, crystallized points of view resulting from social experience, indications of the occupational backgrounds

of this group of students will throw some light on the experience which gave rise to the attitudes. In all, 648 students reported the occupation of their fathers. Over 40 per cent of these are farmers' sons, while 12 per cent are sons of merchants. These two occupations furnish, therefore, over 50 per cent of this student group. Manufacturing and civil service positions with the government account for 13 per cent more. No other occupation is represented in a greater proportion than 3 per cent. (Table 1.) The occupa-

TABLE 1  
THE OCCUPATIONS OF FATHERS OF STUDENTS IN NORTH CAROLINA STATE  
COLLEGE, 1929

Occupation	Number	Per cent
Farming	270	42
Merchant	75	12
Manufacturer	42	6
Government service	41	6
Skilled artisan	22	3
Salesman	21	3
R. R. station agent	18	3
R. R. engineer or conductor	15	2
Teacher	13	2
Contractor	13	2
General business	13	2
Banking	13	2
Real estate	12	2
Physician	12	2
Engineer	11	2
Bookkeeper	9	1
Lumberman	8	1
Factory worker	7	1
Lawyer	7	1
Minister	7	1
Chemist	4	3
Printer	3	
Brick or stone mason	3	
Stock broker	2	
Others	7	1
Total	648	100

tional experience of these students is limited largely, therefore, to farming and general business activities carried on in small towns and cities, for North Carolina has few large cities. This is further indicated by the fact that 55 per cent of the group stated that farming was the chief industry in the area where they were reared. In 13 per cent of the cases textile manufacturing was named as the

chief industry of the area. The attitudes expressed therefore are those of sons of farmers, small town business men, and small city manufacturers in a Southern environment.

### RANKINGS OF THE OCCUPATIONS

Tables 2, 3, and 4 show the scatter of the rankings of the 25 occupations by all students. From these tables, it is apparent that there is a distinct central tendency in the ranking of most of the occupations by all the students from each point of view. If there were no distinct tendency for the students to centralize their rankings about a given position, the ranks would be scattered over the 25 possible positions and no evidence of group attitudes could be deduced. This scattering does occur in the rankings of several occupations and indicates that so far as the total group is concerned there is probably no definite attitude toward these vocations in these respects.

If the attitude of all the students were identical with respect to each occupation, then the rankings of each occupation would center at one position, there would be complete agreement, and perfect confidence could be expressed that all had the same attitude toward the occupation. If there was no central position about which the rankings clustered, and all were scattered equally over the 25 possible positions, then complete disagreement would be expressed and the conclusion could be drawn that there were no group attitudes towards these occupations.

The three tables, however, clearly show that although there is not complete agreement, in the case of each occupation ranked from each point of view, there is a distinct centralization of the ranks about a median position, except in a few cases to be noted later.

In Table 5 these median rankings and the resultant numerical rankings are given. The rankings of these occupations are assignments of positions in a set of 25 places. The best average expression of such positional values is the median, and it is used therefore as the average expression of the group attitude toward each occupation. The numerical rankings are determined from these median rankings.

Examination of these median rankings indicates that there is a significant degree of consistency in the rankings of the occupations by the whole group as to the social contribution of the occupation,



TABLE 2  
THE DISTRIBUTION OF THE RANKINGS OF 25 SELECTED OCCUPATIONS BY 673 NORTH CAROLINA STATE COLLEGE STUDENTS  
AS TO SOCIAL CONTRIBUTION, 1929

Occupation	Rankings																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Clergyman	219	111	57	65	53	37	22	19	21	13	10	12	7	9	4	2	1	3	1	1	2	1	0	2	1
Physician	131	158	102	88	63	36	19	17	16	7	7	7	5	5	1	3	2	2	1	1	1	0	0	1	0
Professor	51	95	131	84	65	52	32	31	32	30	14	15	8	8	7	5	8	1	0	2	0	0	1	1	0
Banker	53	66	70	61	73	79	53	39	30	31	19	18	18	11	8	14	7	5	3	5	3	1	2	2	1
Engineer	14	17	26	48	54	59	71	87	66	50	37	44	30	15	16	12	9	6	2	3	4	1	1	0	1
Manufacturer	26	46	58	40	48	60	73	67	58	51	36	24	30	19	10	6	8	4	3	3	2	1	1	0	0
Lawyer	3	23	62	55	65	55	75	55	43	43	43	20	20	22	15	15	13	9	15	5	4	4	2	5	2
Artist	42	34	33	41	54	48	48	42	35	31	37	32	29	27	20	27	21	8	10	10	19	8	7	7	3
School teacher	38	64	63	79	61	53	42	40	25	42	29	21	24	24	19	13	9	2	4	8	5	2	4	2	0
Farmer	68	33	33	50	42	46	44	39	51	34	36	35	30	23	25	11	19	14	14	5	11	5	1	3	1
Merchant	3	12	9	15	24	25	52	51	74	61	59	62	47	39	38	21	20	11	23	8	8	7	2	1	1
Factory manager	2	2	6	9	19	22	47	49	55	60	82	74	43	37	33	30	29	26	10	10	14	4	3	4	3
Machinist	0	2	2	6	11	16	21	27	23	35	35	45	65	60	62	37	41	48	49	32	22	17	9	4	4
Bookkeeper	0	0	1	2	2	8	7	12	17	24	39	46	52	63	70	75	73	53	49	34	22	11	5	5	3
Carpenter	0	0	2	5	5	18	10	16	25	32	46	47	44	41	60	61	45	64	42	41	29	25	7	4	4
Insurance	0	2	2	0	3	5	17	22	19	21	28	31	52	55	54	41	54	50	38	45	42	32	28	25	7
Salesman	0	0	1	2	4	5	4	5	18	14	26	27	41	54	53	71	65	47	87	47	34	27	31	13	4
Factory operative	0	0	1	1	3	7	7	14	17	25	18	23	35	33	27	53	46	53	46	46	43	56	62	47	10
Barber	0	0	2	2	1	0	3	5	7	9	7	15	18	30	47	49	56	83	59	95	71	49	30	21	14
Blacksmith	0	0	0	1	5	0	2	4	7	14	10	19	19	25	31	47	40	55	72	71	73	76	51	42	9
Baseball player	3	1	4	10	5	9	6	8	8	17	22	18	16	29	24	26	35	45	49	61	75	44	69	64	25
Soldier	0	0	1	5	8	5	7	5	8	12	17	18	18	19	22	25	33	42	46	50	56	85	74	90	27
Chaufeur	0	1	0	0	0	1	0	0	0	2	2	3	5	2	7	5	13	13	28	49	78	114	156	128	66
Man of leisure	20	6	7	4	8	13	10	18	17	13	11	16	12	22	12	18	12	16	10	18	21	25	29	60	276
Ditch digger	0	0	0	0	2	4	2	1	1	2	3	1	6	1	8	6	14	13	22	31	37	75	98	142	204

TABLE 3  
DISTRIBUTION OF THE RANKINGS OF 25 SELECTED OCCUPATIONS BY 673 NORTH CAROLINA STATE COLLEGE STUDENTS  
AS TO THEIR SOCIAL PRESTIGE, 1929

Occupation	Rankings																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Clergyman	118	87	84	56	62	64	30	34	26	33	13	14	10	4	7	7	5	3	3	3	2	4	1	1	2
Physician	62	110	88	98	82	68	50	34	16	19	7	8	6	10	2	1	1	1	4	1	0	1	2	0	2
Professor	12	33	78	83	70	75	81	63	61	38	22	16	6	9	9	1	2	3	1	3	0	0	1	3	3
Banker	178	137	101	60	48	40	26	21	10	17	6	5	5	7	2	4	0	3	1	0	1	0	1	0	0
Engineer	7	11	25	33	39	48	60	74	81	64	51	39	32	32	25	19	14	10	5	1	1	1	0	1	0
Manufacturer	39	59	50	75	63	64	77	68	36	28	21	18	14	9	12	9	10	5	3	1	4	3	2	2	1
Lawyer	27	67	78	77	80	80	67	50	41	28	22	17	8	5	3	7	3	3	2	0	2	1	2	3	0
Artist	102	74	65	41	45	44	59	37	34	35	25	26	8	20	13	6	10	7	5	3	4	7	1	1	1
School teacher	4	10	14	25	24	33	33	36	58	58	61	49	58	54	34	35	27	19	14	9	11	1	5	1	0
Farmer	7	4	7	9	10	8	23	18	36	42	60	49	49	44	62	64	45	23	30	31	17	18	4	9	4
Merchant	3	2	7	13	25	27	37	54	52	55	77	54	63	58	37	29	29	15	11	9	5	6	2	3	0
Factory manager	2	3	9	9	24	28	42	44	72	68	66	62	60	40	41	32	22	13	11	9	5	6	3	2	0
Machinist	0	0	2	1	3	3	4	4	15	20	27	26	47	56	54	63	71	75	58	47	38	19	23	13	4
Bookkeeper	0	1	2	2	8	6	8	10	18	18	39	54	50	77	71	58	62	62	45	30	20	15	11	3	3
Carpenter	0	0	2	2	1	2	2	10	9	14	10	16	29	31	47	48	64	64	98	83	64	35	28	10	4
Insurance	0	2	1	2	3	6	8	21	26	28	42	64	50	52	51	73	57	46	35	31	30	17	18	5	5
Salesman	0	2	2	2	6	5	9	23	9	19	39	50	61	62	67	59	56	47	38	38	30	13	16	16	4
Factory operative	1	0	2	2	4	5	1	6	11	11	11	18	17	24	20	36	34	43	49	40	60	68	76	82	53
Barber	0	0	1	3	3	0	3	2	3	7	5	17	13	15	33	35	44	61	85	98	85	66	63	18	13
Blacksmith	0	1	2	1	3	1	0	2	1	2	5	4	7	9	15	15	24	51	51	68	104	102	78	85	43
Baseball player	10	23	17	19	19	28	17	26	21	34	39	34	30	39	28	29	40	41	37	48	33	26	13	14	8
Soldier	0	1	1	3	2	3	2	3	5	4	13	5	10	16	15	18	27	33	46	63	62	71	83	104	83
Chauffeur	0	2	1	0	0	0	2	2	3	2	1	4	1	2	1	5	8	18	28	38	76	117	144	159	59
Man of leisure	99	43	34	57	49	35	30	29	28	28	11	22	19	17	22	9	15	11	8	13	7	12	13	18	42
Ditch digger	2	1	0	0	0	0	2	2	1	1	0	2	1	1	2	1	3	16	5	6	12	64	83	129	339

TABLE 4  
THE DISTRIBUTION OF THE RANKINGS OF 25 SELECTED OCCUPATIONS BY 673 NORTH CAROLINA STATE COLLEGE STUDENTS  
AS TO ECONOMIC RETURN, 1929

Occupation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Clergyman	7	2	4	12	12	16	19	36	37	30	33	56	41	44	45	40	42	39	30	31	25	18	10	4	
Physician	59	87	97	112	77	76	30	36	31	10	10	10	11	6	3	2	2	5	1	3	2	0	1	2	0
Professor	3	12	22	11	30	42	52	55	52	53	77	49	49	40	37	24	17	11	13	9	3	5	3	3	1
Banker	183	155	112	61	42	36	18	13	10	11	10	5	4	5	3	3	2	0	0	0	0	0	0	0	0
Engineer	46	31	48	90	81	79	79	58	33	35	22	11	18	14	5	8	6	6	0	2	0	1	0	0	0
Manufacturer	183	148	84	45	49	28	34	22	18	9	13	7	5	3	6	6	1	5	1	1	2	1	2	0	0
Lawyer	39	65	77	90	85	65	49	35	46	35	18	25	14	6	8	8	5	6	3	0	1	1	2	1	0
Artist	25	44	50	31	61	45	37	36	31	40	32	19	22	26	19	23	10	23	26	11	21	14	9	11	7
School teacher	1	1	0	5	8	7	13	13	18	17	16	17	44	45	46	58	61	61	67	55	44	35	26	12	1
Farmer	25	10	8	18	17	15	28	30	33	51	40	43	46	44	39	47	31	32	22	28	15	16	20	7	8
Merchant	3	14	32	40	26	36	55	47	50	58	55	50	39	32	26	22	22	22	8	16	7	7	4	5	2
Factory manager	3	15	36	35	61	60	62	63	56	61	47	40	37	27	17	11	13	7	8	3	3	2	5	1	0
Machinist	2	9	9	8	12	25	27	42	43	49	49	52	53	57	52	53	38	24	16	12	12	9	5	3	2
Bookkeeper	0	1	0	4	4	3	18	16	15	10	28	40	46	39	54	54	69	74	65	60	32	23	12	4	2
Carpenter	0	2	5	9	7	14	22	26	24	31	34	53	43	45	52	64	54	65	37	30	35	11	6	3	1
Insurance	0	5	5	8	15	24	31	39	47	40	35	45	52	61	44	36	57	36	23	23	17	18	12	5	1
Salesman	2	6	4	7	9	12	12	33	38	45	51	62	45	52	66	56	39	39	25	22	20	15	4	7	2
Factory operative	1	6	5	6	4	14	8	6	18	16	19	20	29	30	37	37	35	44	52	60	49	57	72	37	11
Barber	0	0	0	1	1	2	5	5	5	4	16	11	11	30	29	30	51	59	98	97	103	56	51	16	2
Blacksmith	0	1	1	2	1	1	8	8	7	8	14	8	20	15	33	36	39	40	73	81	81	85	56	43	12
Baseball player	33	37	48	53	43	44	43	29	38	29	27	24	19	25	14	13	18	27	22	18	17	13	10	23	6
Soldier	0	2	0	1	1	1	0	0	2	2	1	6	1	8	10	7	12	10	24	42	48	84	91	139	181
Chauffeur	1	0	1	0	1	0	0	1	0	5	6	3	5	4	6	11	24	20	38	43	90	139	140	104	31
Man of leisure	57	20	25	21	24	26	21	22	27	23	20	15	17	12	12	19	19	11	16	13	18	18	33	31	142
Ditch digger	0	0	0	1	2	2	2	2	0	1	0	2	2	3	3	6	8	4	7	14	22	38	91	206	257

TABLE 5

THE MEDIAN AND NUMERICAL RANKINGS OF 25 OCCUPATIONS BY 673 NORTH CAROLINA STATE COLLEGE STUDENTS, 1929

	Median ranking			Numerical ranking		
	Social contri- bution	Social prestige	Economic return	Social contri- bution	Social prestige	Economic return
Clergyman	2.9	4.8	14.5	1	3	16
Physician	3.2	4.7	4.9	2	2	3
Professor	4.6	6.6	10.9	3	5	10
Banker	6.1	3.1	2.9	4	1	1
School teacher	6.4	11.6	17.3	5	11	19
Manufacturer	7.6	6.7	3.0	6	6	2
Lawyer	7.8	6.1	5.8	7	4	4
Farmer	8.3	14.4	13.2	8	14	12
Engineer	8.4	9.4	6.4	9	9	5
Artist	8.6	7.0	8.9	10	7	8
Merchant	11.0	11.7	10.5	11	12	9
Factory manager	11.7	11.4	8.6	12	10	6
Machinist	15.6	17.2	12.9	13	18	11
Carpenter	15.6	18.8	15.2	14	19	17
Bookkeeper	15.8	15.6	17.0	15	17	18
Insurance agent	16.3	15.4	13.9	16	15	13
Salesman	17.0	15.5	14.0	17	16	14
Factory operative	18.3	21.2	19.8	18	21	20
Barber	18.9	20.1	19.9	19	20	21
Blacksmith	19.6	21.7	20.1	20	22	22
Baseball player	19.8	14.2	8.9	21	13	7
Soldier	20.7	21.7	23.7	22	23	24
Chauffeur	23.0	23.1	22.5	23	24	23
Man of leisure	23.8	7.3	14.4	24	8	15
Ditch digger	24.0	25.5	24.6	25	25	25

the social prestige one would achieve by following it as a life work, and the economic return one could expect if it were chosen as his life work, except in the case of the clergyman, the school teacher, the college professor, the baseball player, and the man of leisure. The median rankings for the other occupations do vary one or two positions in some cases as to the three social measures, but not enough to be significant.

The classification of these occupations into general types shows that the professions are ranked within the first five places in social contribution, social prestige, and for the most part in economic return. The business and clerical occupations form a second grouping in the rankings, recreational occupations (only baseball included) are fourth, while unskilled occupations are ranked last.

### VARIATION FROM THE CENTRAL POSITION

The three scatter tables indicate the central tendency in each of the distributions, and Table 5 expresses these central tendencies in the form of single values. In order to measure, however, the significance of the central values as expressions of each distribution, it is necessary to measure the amount of variation from these positions in each case. The nature of the distributions obtained by this ranking method makes it impossible to use the forms for expression of variation commonly used. Figure 1 shows diagrammatically the

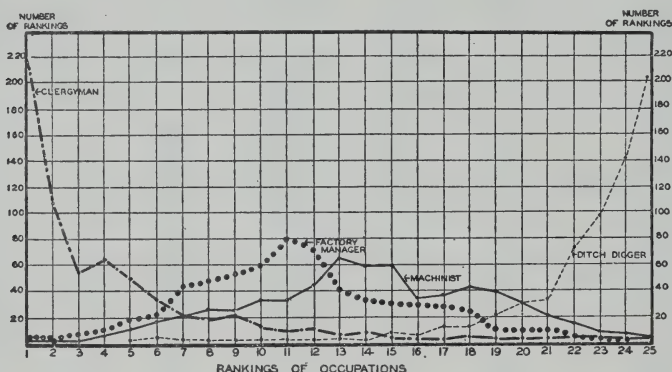


FIGURE 1

DISTRIBUTION OF THE RANKING OF 4 OCCUPATIONS AS TO THEIR SOCIAL CONTRIBUTION BY 673 STUDENTS IN NORTH CAROLINA STATE COLLEGE, 1929

The curves of the distribution of the rankings of the clergyman and the ditch digger show extreme kurtosis while those of the factory manager and the machinist are slightly skewed.

curves obtained from the distribution of the rankings of the clergyman, the factory manager, the machinist, and the ditch digger as to social contribution. If the rankings of the other occupations were similarly graphed, the resulting curves would show variation from a normal curve distribution of all degrees between that of the clergyman to that of the ditch digger. Since the common measures of variation, such as the mean, standard, or quartile variations, are based upon curves of the normal type, it is clear that they cannot be used here.

To express the degree of variation from the central position in each series of rankings so that each would be comparable with the other, the number of rankings in the median position plus those in



the four places closest to the median were added together and the percentage they were of the total number of rankings computed. This gives the percentage of all rankings which lie within the five positions out of the total 25 that center about the median. If in ranking a given occupation there was no central tendency, and therefore no common attitude, then 4 per cent of the total number of ranks would be expected in each position, and only 20 per cent in any five positions. The degree of central tendency about the median value, therefore, is shown here by the size of the percentage in the five places centering about the median value. Twenty other positions remain in which the occupations are ranked, and if a significant proportion of all rankings are found in five positions about the median, it may be concluded that there is a tendency for these students to have similar attitudes toward the occupations. These percentages are contained in Table 6.

TABLE 6

PERCENTAGE OF ALL THE RANKINGS OF 25 SELECTED OCCUPATIONS WITHIN THE MEDIAN POSITION AND THE FOUR POSITIONS CLOSEST TO IT BY 673 NORTH CAROLINA STATE COLLEGE STUDENTS, 1929

Occupation	Social contribution	Social prestige	Economic return
Clergyman	75	52	34
Physician	81	66	67
Professor	63	55	42
Banker	45	78	82
Engineer	47	49	58
Manufacturer	45	52	75
Lawyer	44	53	54
Artist	30	33	28
School teacher	41	42	44
Farmer	32	40	31
Merchant	45	45	39
Factory manager	47	49	45
Machinist	39	48	39
Bookkeeper	49	47	47
Carpenter	37	53	38
Insurance agent	38	42	35
Salesman	48	45	42
Factory operative	36	44	36
Barber	51	59	61
Blacksmith	46	60	53
Baseball player	39	24	27
Soldier	41	48	81
Chauffeur	81	82	77
Man of leisure	61	25	11
Ditch digger	83	93	91

PERCENTAGE VARIATION OF RANKS IN FIVE PLACES  
ABOUT THE MEDIAN

When the students ranked the selected occupations on the basis of social contribution, over 80 per cent of all the ranks fell in the five places closest to the median in the case of the ranking of the physician, the chauffeur, and the ditch digger. In three other instances, the clergyman, the professor, and the man of leisure, between 60 and 80 per cent of the ranks fell within the five places. In one case, the barber, 51 per cent of the ranks fell in the five places. Thus in 7 out of the 25 occupations ranked over 50 per cent of the ranks fell in the five positions closest to the median. In 11 additional cases between 40 and 50 per cent of all the ranks fell in these places. In the rankings of seven occupations between 30 and 39 per cent of all the rankings fell within the five places. In the ranking of no occupation did less than 30 per cent of all the ranks fall within the five places.

In the ranking, therefore, of 21 out of 25 occupations as to social contribution, 40 per cent or more of all ranks fell in the five positions closest to the median. Such distribution shows a significant centralization about the average position and indicates that the large proportion of the students have the same attitude toward the social contribution made by these occupations.

When the same selected occupations were ranked as to the social prestige one would acquire by following them as a life work, in three cases, that of the banker, the chauffeur, and the ditch digger, 78, 82, and 93 per cent respectively of all rankings fell within the five places closest to the median. In two additional cases, the physician and the blacksmith, 66 and 60 per cent of all ranks fell within the five places. In 17 additional cases between 40 and 59 per cent of all rankings fell within the five places closest to the median, while in case of the artist, the baseball player, and the man of leisure there was significant variation in rankings since in these cases only 33, 24, and 25 per cent respectively of all rankings fell within the five places.

When ranked as to the economic return expected, in one case, the ditch digger, 91 per cent of all rankings fell within the five places closest to the median; in two, the banker and the soldier, 82 per cent and 81 per cent were in the five places. In the ranking of four occupations, the physician, the barber, the manufacturer, and

the chauffeur, between 60 and 79 per cent of all ranks were concentrated in the five places about the median. In 8 additional cases between 40 and 59 per cent of all rankings concentrated in a like manner about this average. In ten cases less than 40 per cent of all rankings concentrated in the five places about the median.

In the case of some occupations there was considerably higher concentration about the median in some rankings than in others. Thus, in the case of the clergyman, 75 per cent of all rankings as to social contribution fell in the five places about the median, whereas when this occupation was ranked as to social prestige, only 52 per cent were in this group, and when ranked as to economic return, only 34 per cent. The attitude as to the social contribution of the clergyman shows a higher degree of uniformity than does the attitude toward the social prestige this occupation carries with it and the economic return to be obtained from following it.

In the case of banking, on the other hand, when ranked as to its social contribution, only 45 per cent of the rankings fell in the five places about the median, while the rankings as to its social prestige showed 78 per cent within the five places, and its rankings as to economic return showed 82 per cent of all in the five places. The attitude toward banking as an occupation is that it carries with it much social prestige and economic return, while it does not make as great a social contribution as some other occupations.

The rankings of the "man of leisure" are interesting in this respect. As to social contribution he is rated low, the median rank being 23.8, and the rankings concentrate in the five places about the median to the extent of 61 per cent. But there is very little crystallized point of view about how the man of leisure rates as to social prestige and less as to economic return. The median rank as to social prestige was 7.3, but only 25 per cent of the rankings concentrated in the five places about this median, while the median rank as to economic return was 14.4, but only 11 per cent of the ranks fell in the five places. With these wide scatterings of the rankings, one cannot suggest that there is a "set" toward the man of leisure, either as to his social prestige or economic income.

Some occupations show consistently high concentration of ranks about the median in all three measures. These are the physician, the professor, the banker, the engineer, the manufacturer, the law-

yer, the bookkeeper, the barber, the blacksmith, the chauffeur, and the ditch digger. Toward these occupations, in all three respects, one can conclude that there are fairly fixed points of view in the minds of this student body.

Other occupations show consistently low concentration of ranks about the median. These are the artist, the farmer, the factory operative, the baseball player, and the man of leisure, except in the case of social contribution. Toward these vocations there does not appear to have crystallized out as yet definite points of view which cause the group of students to classify them consistently in a given common position.

Among the other occupations the degree of concentration about the median ranges between 40 and 50 per cent of all ranks. This is about two times as much concentration as would occur if the rankings were spread evenly over the 25 places and is therefore a significant concentration, and indicates a somewhat crystallized point of view toward them.

#### PERCENTAGE OF RANKS IN SEVEN PLACES ABOUT THE MEDIAN

If the number of positions is increased from five to seven, so as to include the positions in which the median falls and the six other positions closest to it, that is, 36 per cent of the 25 possible positions, what increase occurs in the percentage of ranks contained therein?

In the ranking of four of the occupations as to social contribution, over 80 per cent or more of all the ranks fall in the seven positions; in the rankings of 8 occupations, between 60 and 79 per cent of all ranks fall within this area, while in the rankings of the 13 other occupations, between 40 and 59 per cent of all rankings are included in the seven places. In no case does less than 43 per cent of all rankings fall in the seven places. The percentage of all rankings as to social contribution in the seven positions about the median is increased an average of 12 per cent over the percentage of all rankings in the five positions about the median in the case of each occupation.

In the rankings of the occupations as to social prestige, in five cases, between 80 and 95 per cent of all rankings fall in the seven positions in and about the median position, while in the ranking of 14 occupations from 60 to 79 per cent of all ranks fall in the same area. In four cases 40 to 59 per cent of all ranks fall in the

seven positions, while in two cases, those of the baseball player and the man of leisure, 36 and 38 per cent of all ranks respectively fall in seven positions. The per cent of the rankings of all occupations as to social prestige in these seven positions is greater by an average of 14 per cent than the per cent of the rankings of all the occupations in the five places about the median.

When the percentage of all the rankings of each occupation as to economic return is computed for the five positions, it is again found that in three cases over 90 per cent of all ranks are in the seven positions about the median, while in 9 cases between 60 and 89 per cent are in the seven positions, in 11 cases between 40 and 59 per cent are in the seven positions, and in 4 cases less than 40 per cent are in this area. The percentage of ranks in the seven positions is increased an average of 13 per cent over the other positions.

In the rankings of 21 of the 25 occupations as to social contribution more than 50 per cent of all ranks are found in the median position and the 6 positions closest to it, while in only 4 cases are less than 50 per cent of all ranks so distributed. In the rankings of 22 of the 25 occupations as to social prestige over 50 per cent of all ranks are found in these seven positions, while in the rankings of 19 of the 25 occupations as to economic return over 50 per cent of all ranks are found in this same area.

From the results of Tables 6 and 7, therefore, it seems feasible to conclude that, since in the ranking of these selected occupations there is a significant tendency to centralize the rankings closely about a median position in almost every instance, these students have similar attitudes toward them as to their social contribution, social prestige, and economic return, but that in the case of the baseball player and the man of leisure particularly, no such attitudes seem to be present.

#### COMPARISON OF RANKINGS WITH PREVIOUS STUDY

In 1926, a group of 609 students in the same institution ranked the same list of occupations, except that the artist was not then included, from the point of view of social contribution. The method and instructions were the same as those used in the present study (2).

The 1929 group of students who ranked these occupations con-



TABLE 7

THE PERCENTAGE OF ALL THE RANKINGS OF 25 SELECTED OCCUPATIONS THAT LIE WITHIN THE MEDIAN POSITION AND THE SIX POSITIONS CLOSEST TO IT BY 673 NORTH CAROLINA STATE COLLEGE STUDENTS, 1929

Occupation	Social contribution	Social prestige	Economic return
Clergyman	81	74	44
Physician	89	83	80
Professor	76	76	58
Banker	60	88	90
Engineer	61	62	70
Manufacturer	59	64	85
Lawyer	58	70	69
Artist	44	44	42
School teacher	54	56	58
Farmer	43	55	46
Merchant	58	61	53
Factory manager	59	61	61
Machinist	53	63	53
Bookkeeper	64	64	65
Carpenter	54	70	56
Insurance agent	51	58	47
Salesman	63	60	55
Factory operative	47	62	50
Barber	68	75	73
Blacksmith	64	80	68
Baseball player	50	36	38
Soldier	57	69	90
Chauffeur	92	92	87
Man of leisure	65	38	17
Ditch digger	90	95	94

tains in its group of 132 seniors some of the students who were freshmen in 1926.

The median rankings are not now available, but the average numerical rankings are. Table 8 compares the rankings of these occupations by the two groups. The average numerical rankings are almost identical for the two groups. In only one case is there any important change. The 1926 group of students ranked the engineer fifth in order as to social contribution, while the 1929 group ranked him ninth, the 1926 group ranking the school teacher eighth and the farmer ninth, while the 1929 group ranked the school teacher fifth, and the farmer eighth.

Thus it is seen that two different groups of over 600 students from the same environments ranked, on occasions about three years apart, the same list of occupations in almost identical manner. This

TABLE 8

COMPARISON OF THE NUMERICAL RANKINGS OF 25 OCCUPATIONS AS TO THEIR SOCIAL CONTRIBUTION BY TWO GROUPS OF STUDENTS, 673 IN 1929 AND 609 IN 1926, AT NORTH CAROLINA STATE COLLEGE

	Numerical rank	
	1929	1926
Clergyman	1	1
Physician	2	2
Professor	3	3
Banker	4	4
School teacher	5	8
Manufacturer	6	6
Lawyer	7	7
Farmer	8	9
Engineer	9	5
Artist	10	Omitted
Merchant	11	10
Factory manager	12	11
Machinist	13	12
Carpenter	14	14
Bookkeeper	15	13
Insurance agent	16	15
Salesman	17	16
Factory operative	18	17
Barber	19	18
Blacksmith	20	19
Baseball player	21	20
Soldier	22	21
Chauffeur	23	22
Man of leisure	24	23
Ditch digger	25	24

would lend force to the statement that, in this area, the students have fixed points of view towards the occupations and that these have crystallized out of their social experience.

#### THE ATTITUDES OF GROUPS WITHIN THE STUDENT BODY

The previous discussion has indicated that the 673 students included in the study evidence similar attitudes toward 25 selected occupations from three points of view; also that when the average numerical rankings of these occupations as to social contribution are compared with their average numerical ranking by 609 students in the same institution in 1926, they are almost identical, indicating that occupational attitudes in this southern environment are very similar.

The question now arises as to whether different groupings of

students in this student body have similar attitudes toward these occupations. Do the students in the college of agriculture have the same attitudes as those in the college of engineering, or do those in the textile school evidence similar attitudes as do those in the school of science and business? In other words, do students preparing for different vocational careers show different attitudes toward these occupations as evidenced by their rankings? Furthermore, do freshmen differ in their viewpoint toward the occupations when contrasted with the seniors, or, in other words, does the experience gained in college and with the passage of time change the attitudes significantly? What about the farmers' sons? They are the largest grouping in the student body. Do their attitudes differ from those of the other students and do the attitudes of those who expect to return to the farm differ from those who are preparing for engineering? Do the attitudes of the farmers' sons who are seniors differ from those farmers' sons who have newly entered college in the freshman class?

The 673 schedules were reclassified, tabulated, and summarized on the basis of the schools, classes, and farmers' sons.

In Tables 9, 10, and 11 are presented the median rankings of the occupations by these groups. Inspection of each table shows at once that there is very little difference in the average rankings of the occupations between the groupings. The farmers' sons rank the occupations in almost the same positions as do the other groupings. The freshmen place them in almost the same order as do the seniors, while the agriculture students show little variation from the other schools.

In order to indicate more clearly the close similarity in the rankings of these occupations, not only was the median ranking computed but also the quartile I and quartile III ranking for each group, thus giving average rankings at three points on each distribution curve. For these median, quartile I, and quartile III rankings, the Spearman rank coefficients of correlation were computed as between classes and schools.

The coefficients of rank correlation resulting between the rankings of the different schools show that in no instance is the coefficient less than  $+.90$ , either for the median, quartile I, or quartile III rankings as to social contribution, social prestige, and economic return. Little difference exists, therefore, in the rankings of these oc-

THE MEDIAN RANKINGS OF 25 SELECTED OCCUPATIONS AS TO THEIR SOCIAL CONTRIBUTION BY 673 NORTH CAROLINA STATE COLLEGE STUDENTS BY CLASSES AND SCHOOLS, 1929

	Schools					Classes				
	Total group	Farmers' sons	Agriculture	Engineering	Science and Business	Textile	Freshmen	Sophomores	Juniors	Seniors
Clergyman	2.9	3.8	3.0	3.0	3.1	2.4	2.6	3.3	3.4	4.4
Physician	3.2	3.7	3.2	3.4	3.3	2.7	3.6	3.5	3.1	3.4
Professor	4.6	4.2	3.7	5.1	4.8	4.0	4.8	4.5	5.1	4.3
Banker	6.1	6.2	5.8	6.3	6.1	4.3	6.3	5.9	6.1	5.2
Engineer	8.4	9.1	8.8	7.6	8.9	8.5	9.1	8.4	8.6	7.8
Manufacturer	7.6	7.8	9.0	8.0	8.0	6.3	7.9	7.5	8.5	8.0
Lawyer	7.8	8.5	8.1	8.6	7.4	6.9	7.4	7.1	8.6	8.4
Artist	8.6	8.9	8.8	8.1	9.1	9.0	8.1	5.3	9.0	9.8
School teacher	6.4	5.2	4.9	7.0	7.0	5.6	7.0	6.6	6.4	6.2
Farmer	8.3	7.8	5.0	8.9	8.8	10.5	9.8	7.3	7.2	8.5
Merchant	11.0	10.7	10.0	11.6	10.3	10.8	11.0	10.6	11.2	11.6
Factory manager	11.7	11.2	11.4	12.2	11.9	10.0	12.2	12.0	11.5	10.8
Machinist	15.6	14.4	14.0	14.3	14.9	15.6	15.2	14.9	14.5	13.9
Bookkeeper	15.8	16.0	16.0	15.8	15.7	15.9	15.3	16.0	16.3	16.0
Carpenter	15.6	15.1	13.8	15.5	16.1	15.4	16.2	15.9	15.0	15.6
Insurance agent	16.3	16.9	17.3	17.0	16.8	15.3	16.0	18.0	16.8	15.6
Salesman	17.0	17.7	17.3	17.4	16.6	18.0	17.4	17.0	16.9	17.0
Factory operative	18.3	17.7	16.9	15.5	18.2	20.4	18.7	18.8	17.9	18.4
Barber	18.9	18.1	17.4	18.5	19.2	20.2	19.0	18.8	19.3	18.0
Blacksmith	19.6	19.8	18.8	19.3	20.3	19.4	20.0	19.6	19.5	19.2
Baseball player	19.8	18.4	19.5	20.1	20.1	18.1	17.7	20.2	20.1	19.6
Soldier	20.7	19.6	18.9	21.0	21.1	21.2	19.5	20.5	22.0	22.1
Chaufeur	23.0	22.8	22.4	23.0	23.3	22.4	23.1	23.2	23.2	19.8
Man of leisure	23.8	24.7	24.3	24.0	23.3	18.5	23.1	23.3	24.9	24.6
Ditch digger	24.0	23.1	23.1	24.0	24.3	23.1	24.4	24.1	23.7	23.9

TABLE 10  
THE MEDIAN RANKINGS OF 25 OCCUPATIONS AS TO THEIR SOCIAL PRESTIGE BY 673 NORTH CAROLINA STATE COLLEGE STUDENTS BY CLASSES AND SCHOOLS, 1929

	Schools					Classes				
	Total group	Farmers' sons	Agri- culture	Engi- neering	Science and Business	Tex- tile	Fresh- men	Sopho- mores	Juniors	Seniors
Clergyman	4.8	5.0	3.8	5.5	4.6	4.6	4.4	7.4	4.3	3.8
Physician	4.7	4.9	4.8	5.5	5.5	3.7	5.8	4.8	6.6	4.7
Professor	6.6	5.8	5.2	7.5	6.6	6.1	7.2	6.5	9.3	6.6
Banker	3.1	3.6	3.4	2.8	3.5	2.7	3.6	3.3	3.2	2.8
Engineer	9.4	8.4	9.6	8.2	10.8	9.2	9.5	9.3	10.0	9.1
Manufacturer	6.7	7.0	7.2	7.5	7.0	4.6	7.2	6.9	6.8	6.4
Lawyer	6.1	5.7	6.6	6.1	5.9	4.9	5.7	6.1	6.1	6.0
Artist	7.0	6.0	6.4	5.8	5.9	7.1	5.7	6.2	7.2	6.6
School teacher	11.6	11.0	9.4	12.4	11.8	11.2	11.9	11.4	11.4	12.3
Farmer	14.4	12.7	11.5	15.0	14.9	14.0	15.3	13.9	12.2	14.3
Merchant	11.7	12.6	11.9	11.3	11.7	13.0	12.5	10.9	12.2	11.6
Factory manager	11.4	11.2	11.3	11.8	11.4	9.5	11.0	12.8	11.1	10.8
Machinist	17.2	16.0	16.4	17.2	17.7	16.5	16.7	15.6	17.4	18.3
Bookkeeper	15.6	16.4	15.5	15.5	16.5	15.5	15.1	15.8	16.8	14.6
Carpenter	18.8	18.0	18.8	19.0	19.1	17.6	18.8	18.8	18.9	19.1
Insurance agent	15.4	15.1	14.6	17.1	12.8	14.5	15.0	15.5	15.3	14.2
Salesman	15.5	15.6	16.3	17.5	14.8	14.1	15.9	15.6	15.0	14.8
Factory operative	21.2	18.9	18.4	21.3	22.2	21.7	20.5	20.4	21.1	21.5
Barber	20.1	19.7	19.8	19.6	20.4	19.5	19.7	20.3	20.3	20.5
Blacksmith	21.7	21.2	21.9	21.4	22.4	20.5	21.9	21.6	20.9	21.5
Baseball player	14.2	12.2	12.9	15.8	13.5	14.7	13.3	14.6	15.1	15.5
Soldier	21.7	21.6	20.1	22.4	21.8	22.8	21.0	22.1	22.3	22.5
Chaufeur	23.1	23.3	23.3	23.1	23.2	22.9	23.0	23.4	23.5	22.7
Man of leisure	7.3	9.8	8.5	5.9	8.5	7.4	8.1	7.0	7.0	9.2
Ditch digger	25.5	24.9	25.1	25.2	25.2	25.1	25.2	25.2	25.1	25.1



TABLE 11  
THE MEDIAN RANKINGS OF 25 OCCUPATIONS AS TO THEIR ECONOMIC RETURN BY 673 NORTH CAROLINA STATE  
COLLEGE STUDENTS BY CLASSES AND SCHOOLS, 1929

	Schools					Classes				
	Total group	Farmers' sons	Agriculture	Engineering	Science and Business	Textile	Freshmen	Sophomores	Juniors	Seniors
Clergyman	14.5	13.9	15.5	14.7	14.5	13.6	13.8	15.6	15.3	13.7
Physician	4.9	4.2	4.9	5.4	4.7	4.6	5.2	4.4	5.7	4.9
Professor	10.9	10.0	10.0	11.3	11.1	11.3	11.6	10.4	11.5	11.0
Banker	2.9	3.0	3.2	2.9	2.9	2.6	3.2	3.0	2.9	3.1
Engineer	6.4	5.8	6.3	5.8	7.3	5.8	6.7	6.3	6.4	7.1
Manufacturer	3.0	3.9	3.4	3.2	2.9	2.3	3.4	3.3	2.9	2.5
Lawyer	5.8	5.6	11.0	5.9	5.3	4.7	5.4	5.9	6.4	5.8
Artist	8.9	8.4	7.7	10.3	8.6	10.0	8.3	7.9	10.1	11.6
School teacher	17.3	16.6	17.3	17.3	17.9	17.0	17.5	17.4	18.1	17.4
Farmer	13.2	14.2	13.3	14.2	13.2	12.1	15.0	12.4	12.9	12.8
Merchant	10.5	11.3	11.0	11.0	10.6	9.4	12.0	10.3	10.0	9.5
Factory manager	8.6	9.3	9.3	9.1	8.2	7.5	9.4	9.5	8.8	8.2
Machinist	12.9	12.0	13.4	12.4	13.6	12.3	11.9	13.9	12.6	14.3
Bookkeeper	17.0	16.8	17.3	17.0	16.9	16.2	16.6	17.7	16.7	16.6
Carpenter	15.2	14.5	14.8	14.9	15.8	14.7	15.8	14.9	15.5	15.4
Insurance agent	13.9	14.0	14.7	14.5	13.2	12.4	14.7	14.7	12.4	12.3
Salesman	14.0	14.6	13.5	14.8	13.8	12.7	14.3	13.6	13.4	13.5
Factory operative	19.8	16.6	16.2	22.5	19.1	21.2	19.4	18.3	19.5	21.2
Barber	19.9	18.8	19.1	20.9	19.7	18.9	19.6	19.9	19.5	19.5
Blacksmith	20.1	20.2	21.0	19.2	20.9	20.1	20.9	20.2	20.4	19.7
Baseball player	8.9	8.9	8.9	9.7	8.2	10.5	7.7	9.1	9.9	8.9
Soldier	23.7	23.0	23.2	23.9	23.8	23.5	23.3	24.0	23.9	23.9
Chauffeur	22.5	22.7	22.3	22.5	22.6	22.0	22.5	22.9	21.7	22.2
Man of leisure	14.4	16.1	12.8	13.1	17.1	7.7	12.6	15.6	14.0	18.1
Ditch digger	24.6	24.2	24.5	24.7	24.6	24.4	24.8	24.6	24.6	24.4

TABLE 12  
RANK CORRELATIONS BETWEEN THE AVERAGE RANKINGS OF 25 OCCUPATIONS BY 673 NORTH CAROLINA STATE COLLEGE STUDENTS  
ON THE BASIS OF SOCIAL CONTRIBUTION, SOCIAL PRESTIGE, AND ECONOMIC RETURN BY SCHOOLS\*

Schools	Median ranking		Quartile I			Quartile III		
	Social contribution	Social prestige	Economic return	Social contribution	Social prestige	Economic return	Social contribution	Economic return
Agriculture and Engineering	.98	.96	.96	.98	.97	.97	.98	.93
Agriculture and Science and Business	.98	.98	.97	.98	.98	.99	.98	.92
Agriculture and Textile	.95	.97	.95	.94	.97	.97	.94	.90
Engineering and Science and Business	.99	.98	.98	.99	.99	.98	.99	.98
Engineering and Textile	.96	.97	.97	.97	.98	.98	.97	.97
Science and Business and Textile	.97	.98	.95	.97	.98	.98	.98	.96

\*All coefficients were positive so the plus sign is omitted in all tables of correlation coefficients.

TABLE 13  
RANK CORRELATIONS BETWEEN THE AVERAGE RANKINGS OF 25 OCCUPATIONS BY 673 NORTH CAROLINA STATE COLLEGE STUDENTS  
ON THE BASIS OF SOCIAL CONTRIBUTION, SOCIAL PRESTIGE, AND ECONOMIC RETURN BY CLASSES

Classes	Median			Quartile I			Quartile III		
	Social contribution	Social prestige	Economic return	Social contribution	Social prestige	Economic return	Social contribution	Social prestige	Economic return
Freshman-Sophomore	.99	.99	.98	.99	.98	.98	.98	.98	.98
Freshman-Junior	.98	.99	.98	.94	.98	.99	.97	.98	.98
Freshman-Senior	.98	.99	.97	.93	.99	.86	.97	.98	.95
Sophomore-Junior	.99	.98	.99	.95	.99	.99	.98	.90	.97
Sophomore-Senior	.98	.98	.97	.95	.99	.98	.98	.89	.98
Junior-Senior	.99	.98	.98	.94	.99	.99	.98	.99	.98

TABLE 13a  
RANK CORRELATIONS BETWEEN THE AVERAGE RANKINGS OF 25 OCCUPATIONS BY 257 FARMERS' SONS WHO ARE STUDENTS AT N. C.  
STATE COLLEGE ON THE BASIS OF SOCIAL CONTRIBUTION, ECONOMIC RETURN, AND SOCIAL PRESTIGE BY CLASSES  
OF WHICH THEY ARE MEMBERS

Classes	Median			Quartile I			Quartile III		
	Social contribution	Social prestige	Economic return	Social contribution	Social prestige	Economic return	Social contribution	Social prestige	Economic return
Freshman-Sophomore	.93	.97	.97	.97	.97	.98	.98	.92	.97
Freshman-Junior	.94	.98	.96	.94	.97	.97	.97	.93	.95
Freshman-Senior	.93	.97	.98	.94	.97	.98	.98	.90	.97
Sophomore-Junior	.98	.98	.96	.98	.98	.98	.97	.98	.97
Sophomore-Senior	.98	.98	.96	.95	.98	.98	.98	.96	.97
Junior-Senior	.98	.98	.98	.95	.97	.97	.98	.97	.98

cupations between any of the groups. (Table 12.) Their attitudes seem to be almost identical. Students who prepare for engineering rank these occupations in the same way and with the same degrees of variation within their own numbers as do the students of agriculture, textiles, or science and business.

When the coefficients resulting from computation of the correlations between the classes are studied, they show the same results as those between the schools. (Table 13.) Only in two instances are coefficients of less than  $+.80$  found, one of  $+.89$  between the quartile III rankings of the sophomores and juniors as to social prestige, and one of  $+.86$  between the quartile I rankings of the freshmen and seniors as to economic return. In all other cases the coefficients are well above  $+.90$ .

Attitudes within this college group toward the occupations do not seem to vary from the freshman to the senior years. The added experience, education, and time acquired from college experience do not seem to change the mental sets acquired by these students from their earlier experience and environments.

When the farmers' sons were divided into similar groups, and the coefficients computed, the same results occur as with the schools and classes. (Tables 13 and 14.)

The general conclusion to which these results must lead is that, over a fairly long period of time, Southern tradition in rural and small town areas has placed emphasis upon certain occupations, particularly the professions, ranking them high in social contribution, awarding an accompanying social prestige and economic return, while toward other occupations less favorable attitudes are expressed. These traditional points of view are diffused through the population, transmitted to oncoming generations, and crystallized out as fairly fixed attitudes, as the measures here indicate. Each occupation acquires a fairly fixed social status in the thinking of the total social group, and the students' reactions reflect these fixed viewpoints, mental sets which, at least, college experiences do not seem to change.

#### THE ASSOCIATIONS BETWEEN THE RANKINGS AS TO SOCIAL CONTRIBUTION, SOCIAL PRESTIGE, AND ECONOMIC RETURN

Each of the students ranked each occupation from three points of view, the contribution it makes to social well-being, the prestige one would acquire if he followed a given occupation, and the economic return one may expect from following the occupation.

TABLE 14

RANK CORRELATIONS BETWEEN THE AVERAGE RANKINGS OF 25 OCCUPATIONS BY 257 FARMERS' SONS WHO ARE STUDENTS AT N. C. STATE COLLEGE ON THE BASIS OF SOCIAL CONTRIBUTION, ECONOMIC RETURN, AND SOCIAL PRESTIGE BY SCHOOLS IN WHICH THEY ARE STUDYING

Rating between school of	Median rating			Quartile I rating			Quartile III rating		
	Social contri- bution	Social prestige	Economic return	Social contri- bution	Social prestige	Economic return	Social contri- bution	Social prestige	Economic return
Agriculture and Engineering	.98	.98	.97	.99	.95	.97	.99	.97	.98
Agriculture and Science and Business	.99	.98	.98	.98	.98	.98	.93	.94	.98
Agriculture and Textile	.95	.97	.88	.93	.94	.95	.98	.84	.96
Engineering and Science and Business	.99	.97	.98	.98	.97	.98	.99	.94	.98
Engineering and Textile	.93	.97	.91	.94	.90	.94	.95	.84	.97
Science and Business and Textile	.95	.97	.89	.94	.94	.94	.95	.96	.97



Do the rankings of the occupations as to social contribution show a higher degree of association with their rankings as to social prestige or with their rankings as to economic return? Do the rankings as to the social prestige of the occupations show a higher degree of association with the rankings as to social contribution or with the rankings as to economic return?

Are the associations between the rankings as to social contribution and economic return, social contribution and social prestige, and social prestige and economic return similar as between the schools and the classes? The answer to these questions will indicate whether the social contribution an occupation makes ties up more closely, in the attitudes of these students, with the social prestige associated with it or the economic return they think it offers, or whether social prestige is more closely related to economic return.

The rank correlation coefficients show that social prestige is related more closely to economic return than it is to social contribution, while social contribution is related to economic return less closely than the other factors are to each other. This is true for the associations between the median and quartile rankings, both from the point of view of the school groups, the class groups, and the farmers' sons. (Tables 15, 16, 17, 18.) The associations between the rankings as to social contribution and economic return give consistently lower coefficients than those between social contribution and social prestige, and those between social contribution and social prestige are consistently lower than those between social prestige and economic return. These groups of students consistently associate the social prestige and the economic return they think occupations carry with them more closely than they associate the social contribution they think an occupation makes with either its social prestige or economic return.

#### SUMMARY AND CONCLUSIONS

This analysis of the attitudes of 673, 44 per cent, of the North Carolina State College students as of 1929 toward 25 selected occupations makes use of the ranking method to discover the presence or absence of group attitudes toward these occupations.

The students ranked the 25 occupations from a highest position of 1 to a lowest position of 25, on three different bases; namely, the contribution they considered the occupation to make to social well-

TABLE 15

RANK CORRELATIONS BETWEEN THE AVERAGE RANKINGS OF 25 OCCUPATIONS BY 673 NORTH CAROLINA STATE COLLEGE STUDENTS  
BY SCHOOLS ON THE BASIS OF SOCIAL CONTRIBUTION, SOCIAL PRESTIGE, AND ECONOMIC RETURN

Schools	Quartile I				Quartile III			
	Social contri- bution and prestige	Social contri- bution and prestige	Social contri- bution and economic return	Social contri- bution and economic return	Social contri- bution and economic return	Social contri- bution and economic return	Social contri- bution and economic return	Social contri- bution and economic return
Agriculture	.83	.86	.87	.77	.89	.93	.75	.83
Engineering	.80	.87	.87	.72	.90	.87	.83	.89
Science and Business	.84	.86	.89	.82	.91	.94	.86	.87
Textile	.91	.91	.94	.83	.91	.91	.82	.85

TABLE 16

RANK CORRELATIONS BETWEEN THE AVERAGE RANKINGS OF 25 OCCUPATIONS BY 673 NORTH CAROLINA STATE COLLEGE STUDENTS  
BY CLASSES ON THE BASIS OF SOCIAL CONTRIBUTION, SOCIAL PRESTIGE, AND ECONOMIC RETURN

Classes	Quartile I				Quartile III			
	Social contri- bution and prestige	Social contri- bution and prestige	Social contri- bution and social prestige	Social contri- bution and economic return	Social contri- bution and economic return	Social contri- bution and social prestige	Social contri- bution and economic return	Social contri- bution and economic return
Freshman	.86	.89	.92	.83	.91	.93	.82	.89
Sophomore	.83	.88	.89	.80	.90	.81	.81	.89
Junior	.80	.86	.83	.74	.89	.88	.82	.81
Senior	.83	.85	.77	.73	.88	.92	.83	.91

TABLE 17

RANK CORRELATIONS BETWEEN THE AVERAGE RANKINGS OF 25 OCCUPATIONS ON THE BASIS OF SOCIAL CONTRIBUTION, SOCIAL PRESTIGE, AND ECONOMIC RETURN BY 257 FARMERS' SONS BY SCHOOLS, WHO ARE STUDENTS AT N. C. STATE COLLEGE

Schools	Median			Quartile I			Quartile III		
	Social contribution and social prestige	Social contribution and economic return	Social prestige and economic return	Social contribution and economic return	Social contribution and economic return	Social prestige and economic return	Social contribution and economic return	Social contribution and economic return	Social prestige and economic return
Agriculture	.85	.75	.82	.86	.80	.87	.81	.74	.87
Engineering	.78	.72	.88	.72	.72	.88	.79	.79	.76
Science and Business	.85	.76	.88	.85	.77	.89	.91	.78	.88
Textile	.83	.75	.92	.80	.73	.86	.94	.84	.89

TABLE 18

RANK CORRELATIONS BETWEEN THE AVERAGE RANKINGS OF 25 OCCUPATIONS ON THE BASIS OF SOCIAL CONTRIBUTION, SOCIAL PRESTIGE, AND ECONOMIC RETURN BY 257 FARMERS' SONS WHO ARE STUDENTS AT N. C. STATE COLLEGE BY COLLEGE CLASSES

Classes	Median			Quartile I			Quartile III		
	Social contribution and social prestige	Social contribution and economic return	Social prestige and economic return	Social contribution and social prestige	Social contribution and economic return	Social prestige and economic return	Social contribution and economic return	Social contribution and economic return	Social prestige and economic return
Freshman	.83	.73	.89	.88	.85	.91	.89	.79	.88
Sophomore	.85	.76	.89	.83	.81	.89	.92	.83	.88
Junior	.78	.72	.80	.88	.73	.83	.89	.73	.82
Senior	.76	.74	.82	.81	.75	.92	.85	.77	.82

being, the social prestige accorded by the social group to the individual who followed it as a life work, and the economic return one might expect from the occupation.

The rankings were tabulated by schools, classes, farmers' sons, and the total group, scatter diagrams made, and the median and quartile averages computed.

The median and numerical rankings show that the professions, that is, the clergyman, physician, professor, the banker, the lawyer, the engineer and the artist, are ranked highest as to social contribution, social prestige, and, for the most part, as to economic return by the total group and by all the subdivisions made within the total group.

The business positions, the manufacturer, the merchant, the farmer, and the factory manager, are ranked in the next group, while the skilled trades, the machinist and the carpenter, come next in order.

The clerical positions, such as bookkeeping, the insurance agent, and the salesman, are ranked next in order, while the unskilled trades are ranked last.

The baseball player is ranked very low as to social contribution, in the middle of the scale as to social prestige, but seventh in economic return.

The man of leisure is ranked next to the bottom as to social contribution, about the middle as to economic return, but eighth as to social prestige.

These average rankings are similar for all of the groups and show a definite consistency with the total average rankings in all cases.

Computation of the per cent of concentration around the median ranking indicates strong tendencies to centralize the rankings about this average rank, in all groups, and for each occupation, except for the baseball player and the man of leisure, and that, therefore, these rankings indicate the presence of crystallized viewpoints toward the occupations, which one may call their occupational attitudes.

When the average rankings of these occupations by these 673 students as to their social contributions are compared with the average rankings of the same occupations, except for the omission of the artist, by 609 students in the same institution in 1926, the results are almost identical. Two different groups of students from the same general geographic area, on occasions three years apart, rank



the same list of occupations in the same manner, indicating the presence of fixed points of view acquired from their social experience.

When the total group of students was subdivided into mutually exclusive classes, such as freshmen, sophomores, juniors, and seniors, and into groupings by schools, such as agriculture, engineering, science and business, and textile, and into farmers' sons, and the rank coefficients of correlation between the median, quartile I, and quartile III ranks between these groupings computed, the results show that the different groupings within the total student body rank the occupations in almost identical manners. Students who are preparing for engineering rank the occupations in the same way and with the same degrees of variation from the median rank as do students preparing for agriculture, or business, or the textile world. Seniors show little difference in their rankings from freshmen, so that added experience, school training, and the passage of time do not seem to influence these "mental sets" acquired from the social milieu. Farmers' sons rank the occupations in practically the same order as the other groups, and when the group of farmers' sons is subdivided into classes on the basis of school and year in college there are no significant variations from other groups or within this group.

Not only, therefore, is there similar ranking of these occupations by the whole group from the three viewpoints, but the subdivisions of the total group show the same rankings and the same degree of variation from the average rankings, showing that there are definite "mental sets" toward the occupations.

The rank correlations between the average rankings of these occupations as to social contribution, social prestige, and economic return, both by classes, schools, and farmers' sons, show that the social prestige and the economic return supposedly attached to the occupations are more closely related than is social prestige with social contribution or social contribution with economic return, in the minds of these students.

This study seems to make a contribution to the method of measuring the presence or absence of attitudes toward social phenomena in social groups. By ranking given phenomena in relation to the definite criteria and computing the central tendencies in the ranks of these phenomena within the group, it would appear possible to discover the existence or absence of attitudes in different social groups. The writer hopes to apply this method in the effort to discover the presence or absence of racial and religious attitudes.



The results of this study also have a practical application. Attitudes are basic social forces. Individual action is guided in a measure by the attitudes of the social groups, and by the attitudes acquired from the group. In the vocational field, occupational preparation would no doubt be affected, possibly unconsciously but yet effectively, by the group attitude toward the occupation. The values which the group expresses, in relation to a given social situation, influence the choices of the individual, so that he is guided by these group values in the choice of his life work. Vocational guidance programs must consider these social attitudes toward the occupations.

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## LES ATTITUDES DES ÉTUDIANTS UNIVERSITAIRES À L'ÉGARD DES OCCUPATIONS PROFESSIONNELLES

(Résumé)

Cette étude analyse les attitudes de 673 étudiants universitaires mâles à l'égard de 25 occupations professionnelles choisies. Elle essaie de constater la présence ou l'absence des opinions fixées chez les groupes sociaux élevés dans le même milieu social général. Ces étudiants ont mis en ordre de rang 25 occupations, en commençant par la position supérieure 1 et en terminant par la position inférieure 25 sur trois bases différentes: (1) la contribution faite au bien-être social par l'occupation, à leur avis; (2) le prestige social accordé par le groupe social à celui qui choisit l'occupation comme carrière; (3) le rendement économique que l'occupation pourrait donner. La computation du pourcentage de concentration près de la classification médiane indique de fortes tendances à centraliser les estimations à cette moyenne chez tous les groupes, de sorte que les estimations indiquent la présence d'opinions fixées à l'égard des occupations, lesquelles on peut considérer des attitudes. Quand on compute les coefficients de corrélation de l'ordre de rang entre les divers groupes, les résultats montrent que les classifications des occupations sont presque identiques.

Donc, au moyen de mettre en ordre de rang des phénomènes donnés à l'égard de critères définis et de computer les tendances centrales dans la classification de ces phénomènes chez le groupe, il semblerait possible de constater l'existence ou l'absence des attitudes chez les divers groupes sociaux.

ANDERSON

## BERUFSANSICHTEN VON UNIVERSITÄTSSTUDENTEN

(Referat)

Dieses Studium untersucht die Ansichten von 673 Universitätsstudenten bezüglich 25 ausgewählter Berufe. Der Versuch wird gemacht, das Vorhandensein oder Nichtvorhandensein von kristallisierten Ansichten in sozialen Gruppen zu entdecken, die in demselben sozialen Milieu aufgewachsen sind. Diese Studenten rangierten 25 Berufe von dem höchsten Stand von 1 bis zu dem niedrigsten Stand von 25 nach drei verschiedenen Kriterien: (1) der Beitragung zu dem sozialen Wohl, die sie diesen Beruf zuschreiben; (2) dem sozialen Ansehen, das dem Individuum von der sozialen Gruppe verliehen wird, das diesen Beruf als Lebensarbeit verfolgt; (3) dem wirtschaftlichen Gewinn, den man von dem Beruf erwarten möchte. Die Ausrechnung des Prozentsatzes der Konzentrierung um die Mittelrangierung zeigt starke Neigungen zur Vereinigung der Rangierungen um diesen Durchschnitt bei allen Gruppen, so dass sie das Vorhandensein der kristallisierten Ansichten bezüglich der Berufe andeuten, die als Einstellungen angesehen werden können. Wenn die Rangkoeffizienten der Korrelation zwischen verschiedenen Gruppen ausgerechnet werden, erwiesen die Ergebnisse, dass Rangierungen der Berufe fast identisch sind.

Daher scheint es möglich das Vorhandensein oder Nichtvorhandensein von Ansichten bei verschiedenen sozialen Gruppen durch die Rangierung gegebener Phänomene im Verhältnis zu bestimmten Kriterien und durch die Ausrechnung der Zentraltendenzen in den Rangierungen dieser Phänomene innerhalb der Gruppe zu entdecken.

ANDERSON

## NEUROTICISM IN MARRIAGE: II. THE INCIDENCE OF NEUROTICISM (*continued*)

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RAYMOND ROYCE WILLOUGHBY

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*Social.* The following 59 items refer to social situations and attitudes:

- 1 As a child did you like to play alone?
- 2 Do you usually control your temper?
- 3 Do you get stage fright?
- 10 Do you take responsibility for introducing people at a party?
- 12 Do you find it difficult to get rid of a salesman?
- 13 Do you have difficulty in starting conversation with a stranger?
- 15 Do you laugh easily?
- 17 Are you careful not to say things to hurt people's feelings?
- 18 Are you sometimes the leader at a social affair?
- 25 Are you interested in meeting a lot of different kinds of people?
- 28 Are your feelings easily hurt?
- 30 Do you keep in the background on social occasions?
- 33 Have you found books more interesting than people?
- 36 Are there many people that you dislike intensely?
- 41 Does it upset you to lose in a competitive game?
- 43 Do you usually trust people?
- 44 Do you lose your temper quickly?
- 57 Are you troubled with shyness?
- 61 Do people find fault with you more than you deserve?
- 67 Do you know of anybody who is trying to do you harm?
- 70 If you come late to a meeting would you rather stand or leave than take a front seat?
- 72 Do you tend to nonconformity in your political, religious, and social beliefs?
- 80 Do you often say things on the spur of the moment and then regret them?
- 83 Is there anyone you want to get even with?
- 89 Do you like to be by yourself a great deal?
- 91 Do you allow people to crowd ahead in line?
- 94 Does it bother you to have people watch you at work even when you do it well?
- 98 Can you stand criticism without feeling hurt?
- 99 Do you have difficulty in making friends?
- 100 Are you troubled with the idea that people are watching you on the street?
- 112 Can you stand kidding?
- 115 Do you make friends easily?
- 116 Have your employers generally treated you right?
- 119 Are you ever bothered by the feeling that people are reading your thoughts?
- 120 Do you have the habit of contradicting people?

- 123 Do you think you are often regarded as queer?  
 126 Do you often feel you do not get your chance in social conversation?  
 131 Have your friends ever turned against you?  
 138 Do you ever cross the street to avoid meeting somebody?  
 140 Do you like to be with other people a great deal?  
 143 Do you think people have made quite a lot of fun of you?  
 145 Do you feel self-conscious when you recite in class?  
 150 At a reception or tea do you seek to meet the important person present?  
 157 When you were young did the other children regard you as "different"?  
 161 Do you hesitate to volunteer in a class recitation?  
 169 Do you enjoy social gatherings just to be with people?  
 173 Do you mind having your friends see you in the ten-cent store?  
 175 Do you dislike to write about yourself even to very close friends?  
 178 Does criticism disturb you badly?  
 180 Do you ever take the lead to enliven a dull party?  
 181 Do you often feel self-conscious in the presence of superiors?  
 182 Do you get tired of people quickly?  
 187 Do you find it difficult to speak in public?  
 195 Do you often feel self-conscious because of your personal appearance?  
 196 If you see an accident are you quick to take an active part in giving help?  
 205 Do you think you are regarded as critical of other people?  
 207 Do you let yourself go when angry?  
 209 Do you often get interested in people you meet?  
 215 Were you considered a bad boy (or girl)?

The following are the percentages of each sex answering each of the above items in the maladjusted manner:

	1	2	3	10	12	13	15	17	18	25
Husbands	31	6	35	47	25	39	22	16	39	40
Wives	37	21	67	39	27	33	19	14	42	24
Male students	23	10	60	40	25	29	14	17	50	14
Female students	24	23	50	19	27	30	14	12	25	6
	28	30	33	36	41	43	44	57	61	67
Husbands	38	38	35	7	17	15	16	26	4	5
Wives	47	38	29	5	14	11	29	32	5	1
Male students	38	27	19	8	18	18	15	33	10	8
Female students	37	22	36	10	15	11	22	33	10	3
	70	72	80	83	89	91	94	98	99	100
Husbands	36	64	43	9	38	41	24	44	28	5
Wives	29	56	55	5	41	50	46	50	23	9
Male students	34	36	53	15	42	36	37	29	21	18
Female students	43	19	67	10	40	35	54	17	18	30

	112	115	116	119	120	123	126	131	138	140
Husbands	13	30	3	2	25	13	11	8	34	47
Wives	26	26	3	4	23	11	8	10	35	44
Male students	11	25	2	6	23	23	14	18	40	21
Female students	8	22	1	15	22	19	14	16	46	17
	143	145	150	157	161	169	173	175	178	180
Husbands	5	32	74	18	32	47	2	26	27	39
Wives	6	54	76	19	34	29	2	17	47	41
Male students	18	46	47	13	49	34	11	32	21	31
Female students	17	42	47	7	34	19	8	31	20	33
	181	182	187	195	196	205	207	209	215	
Husbands	37	18	36	27	39	41	16	32	4	
Wives	57	18	59	45	52	40	33	20	8	
Male students	50	23	48	45	14	29	16	14	4	
Female students	49	22	50	40	28	19	20	6	4	

The following are the distributions for these percentages:

	0	5	10	15	20	25	30	35	40	45
Husbands	5	7	3	7	2	7	6	12	5	3
Wives	4	7	5	4	5	7	4	4	5	4
Male students	2	3	10	10	7	6	5	4	3	5
Female students	3	5	7	12	9	3	6	3	4	3
	50	55	60	65	70	75	M	$\sigma$		
Husbands	0	0	1	0	1	0	26.6	15.9		
Wives	4	4	0	1	0	1	29.5	18.3		
Male students	3	0	1	0	0	0	25.7	14.5		
Female students	3	0	0	1	0	0	24.5	14.6		

These items may be separated into low, medium, and high incidence groups, as follows:

#### *Husbands*

*Low*—119 thoughts being read (2%), 173 mind, ten-cent store (2%), 116 treated right, employers (3%), 61 people find fault (4%), 215 bad child (4%), 67 threatened with harm (5%), 100 being watched (5%), 143 made fun of (5%), 2 control temper (6%), 36 dislike people (7%), 131 turned against (8%), 83 get even (9%), 126 denied social chance (11%), 112 stand kidding (13%), 123 thought queer (13%), 43 trust people (15%), 17 avoid hurting feelings (16%), 44 lose temper (16%), 207 angry, let go (16%) 41 upset to lose (17%), 157 different when young (18%), 182 tired, people (18%).

*Medium*—15 laugh easily (22%), 94 self-conscious at work (24%), 12 can't dismiss salesman (25%), 120 contradicting habit (25%), 57 shyness



(26%), 175 dislike writing about self (26%), 178 disturbed by criticism (27%), 195 self-conscious over appearance (27%), 99 difficulty making friends (28%), 115 make friends easily (30%), 1 play alone (31%), 145 self-conscious in recitation (32%), 161 hesitate in recitation (32%), 209 interested, people met (32%), 138 avoid meetings (34%), 3 stage fright (35%), 33 books more interesting (35%), 70 late, rather stand (36%), 187 public speaking difficult (36%), 181 self-conscious with superiors (37%), 28 feelings hurt (38%), 30 keep in background (38%), 89 be by yourself (38%), 13 difficulty starting conversation (39%), 18 social leader (39%), 180 enliven dull party (39%), 196 help in accident (39%), 25 interested, meeting people (40%), 91 allow crowding (41%), 205 thought critical (41%), 80 talk and regret (43%), 98 stand criticism (44%).

*High*—10 introductions at party (47%), 140 like companionship (47%), 169 enjoy social gatherings (47%), 72 nonconformity (64%), 150 meet important person (74%).

#### *Wives*

*Low*—67 threatened with harm (1%), 173 mind, ten-cent store (2%), 116 treated right, employers (3%), 119 thoughts being read (4%), 36 dislike people (5%), 61 people find fault (5%), 83 get even (5%), 143 made fun of (6%), 126 denied social chance (8%), 215 bad child (8%), 100 being watched (9%), 131 turned against (10%), 43 trust people (11%), 123 thought queer (11%), 17 avoid hurting feelings (14%), 41 upset to lose (14%), 175 dislike writing about self (17%), 182 tired, people (18%), 15 laugh easily (19%), 151 different when young (19%).

*Medium*—interested, people met (20%), 2 control temper (21%), 99 difficulty making friends (23%), 120 contradicting habit (23%), 25 interested, meeting people (24%), 112 stand kidding (26%), 115 make friends easily (26%), 12 dismiss salesman (27%), 33 books more interesting (29%), 44 lose temper (29%), late, rather stand (29%), 129 enjoy social gatherings (29%), 57 shyness (32%), 13 difficulty starting conversation (33%), 207 angry, let go (33%), 161 hesitate in recitation (34%), 138 avoid meetings (35%), 1 play alone (37%), 30 keep in background (38%), 10 introductions at party (39%), 205 thought critical (40%), 89 be by yourself (41%), 180 enliven dull party (41%), 18 social leader (42%), 140 like companionship (44%).

*High*—195 self-conscious over appearance (45%), 94 self-conscious at work (46%), 23 feelings hurt (47%), 178 disturbed by criticism (47%), 91 allow crowding (50%), 98 stand criticism (50%), 196 help in accident (52%), 145 self-conscious in recitation (54%), 80 talk and

regret (55%), 72 nonconformity (56%), 181 self-conscious with superiors (57%), 187 public speaking difficult (59%), 3 stage fright (67%), 150 meet important person (76%).

#### *Male students*

*Low*—116 treated right, employers (2%), 215 bad child (4%), 119 thoughts being read (6%), 36 dislike people (8%), 67 threatened with harm (8%), 2 control temper (10%), 61 people find fault (10%), 112 stand kidding (11%), 173 mind, ten-cent store (11%), 157 different when young (13%), 15 laugh easily (14%), 209 interested, people met (14%), 126 denied social chance (14%), 196 help in accident (14%), 25 interested, meeting people (14%), 44 lose temper (15%), 83 get even (15%), 207 angry, let go (16%), 17 avoid hurting feelings (17%), 41 upset to lose (18%), 43 trust people (18%), 100 being watched (18%), 131 turned against (18%), 143 made fun of (18%), 33 books more interesting (19%).

*Medium*—99 difficulty making friends (21%), 140 like companionship (21%), 178 disturbed by criticism (21%), 1 play alone (23%), 120 contradicting habit (23%), 123 thought queer (23%), 182 tired, people (23%), 12 can't dismiss salesman (25%), 115 make friends easily (25%), 30 keep in background (27%), 13 difficulty starting conversation (29%), 98 stand criticism (29%), 205 thought critical (29%), 180 enliven dull party (31%), 175 dislike writing about self (32%), 57 shyness (33%), 70 late, rather stand (34%), 169 enjoy social gathering (34%), 72 nonconformity (36%), 91 allow crowding (36%), 94 self-conscious at work (37%), 28 feelings hurt (38%), 10 introductions at party (40%), 138 avoid meetings (40%), 89 be by yourself (42%).

*High*—195 self-conscious over appearance (45%), 145 self-conscious in recitation (46%), 150 meet important person (47%), 187 public speaking difficult (48%), 161 hesitate in recitation (49%), 18 social leader (50%), 181 self-conscious with superiors (50%), 80 talk and regret (53%), 3 stage fright (60%).

#### *Female students*

*Low*—116 treated right, employers (1%), 67 threatened by harm (3%), 215 bad child (4%), 25 interested, meeting people (6%), 209 interested, people met (6%), 157 different when young (7%), 112 stand kidding (8%), 173 mind, ten-cent store (8%), 36 dislike people (10%), 61 people find fault (10%), 83 get even (10%), 43 trust people (11%), 17 avoid hurting feelings (12%), 15 laugh easily (14%), 126 denied social chance (14%), 41 upset to lose (15%), 119 thoughts being read (15%), 131 turned against (16%), 98 stand criticism (17%), 140

like companionship (17%), 143 made fun of (17%), 99 difficulty making friends (18%), 10 introductions at party (19%), 123 thought queer (19%), 169 enjoy social gatherings (19%), 205 thought critical (19%).

*Medium*—178 disturbed by criticism (20%), 207 angry, let go (20%), 30 keep in background (22%), 44 lose temper (22%), 115 make friends easily (22%), 120 contradiction habit (22%), 182 tired, people (22%), 2 control temper (23%), 1 play alone (24%), 18 social leader (25%), 12 can't dismiss salesman (27%), 196 help in accident (28%), 13 difficulty starting conversation (30%), 100 being watched (30%), 175 dislike writing about self (31%), 57 shyness (33%), 180 enliven dull party (33%), 161 hesitate in recitation (34%), 91 allow crowding (35%), 33 books more interesting (36%), 28 feelings hurt (37%), 89 be by yourself (40%), 195 self-conscious over appearance (40%), 145 self-conscious in recitation (42%), 70 late, rather stand (43%).

*High*—138 avoid meetings (46%), 150 meet important person (47%), 181 self-conscious with superiors (49%), 3 stage fright (50%), 187 public speaking difficult (50%), 94 self-conscious at work (54%), 80 talk and regret (67%).

The indications are that students are slightly better adjusted in the social realm than are the married couples, but that the latter show no marked intra-pair differences. In the following distributions of *differences*, the male and married percentages will be taken as the minuend in each case; the differences will first be shown by serial number:

	1	2	3	10	12	13	15	17	18	25	28	30
H—W	—6	—15	—32	8	—2	6	3	2	—3	16	—9	0
H—MS	8	—4	—25	7	0	10	8	—1	—11	26	0	11
W—FS	7	—2	17	20	0	3	5	2	17	18	10	16
MS—FS	—1	—13	10	21	—2	—1	0	5	25	8	1	5
	33	36	41	43	44	57	61	67	70	72	80	83
H—W	6	2	3	4	—13	—6	—1	4	7	8	—12	4
H—MS	16	—1	—1	—3	1	—7	—6	—3	2	28	—10	—6
W—FS	—7	—5	—1	0	7	—1	—5	—2	—14	37	—12	—5
MS—FS	—15	—2	3	7	—7	0	0	5	—9	17	—14	5
	89	91	94	98	99	100	112	115	116	119	120	123
H—W	—3	—9	—22	—6	5	—4	—13	4	0	—2	2	2
H—MS	—4	5	—13	15	7	—13	2	5	1	—4	2	—10
W—FS	1	15	—8	33	5	—21	18	4	2	—11	1	—8
MS—FS	2	1	—17	12	3	—12	3	3	1	—9	1	4

	126	131	138	140	143	145	150	157	161	169	173	175
H—W	3	-2	-1	3	-1	-22	-2	-1	-2	18	0	9
H—MS	-3	-10	-6	26	-13	-14	27	5	-17	13	-9	-6
W—FS	-6	-6	-9	-27	-11	12	29	12	0	10	-6	-14
MS—FS	0	2	-6	4	1	4	0	6	15	15	3	1

	178	180	181	182	187	195	196	205	207	209	215
H—W	-20	-2	-20	0	-23	-18	-12	1	-17	12	-4
H—MS	6	8	-13	-5	-12	-18	25	12	0	18	0
W—FS	27	8	8	-4	9	5	24	21	13	14	4
MS—FS	1	-2	1	1	-2	5	-14	10	-4	8	0

The distributions of differences are as follows:

	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20
H—W	1	0	3	5	4	5	14	17	7	1	2	0
H—MS	0	0	1	2	7	9	10	9	9	4	3	0
W—FS	0	1	1	0	5	7	8	10	8	6	6	3
MS—FS	0	0	0	1	5	4	7	25	9	3	3	1

	25	30	35	M	$\sigma$
H—W	0	0	0	-3.4	9.7
H—MS	5	0	0	1.7	12.0
W—FS	2	1	1	4.1	13.0
MS—FS	1	0	0	1.9	8.5

Adopting 10% (10% and over on the plus side and over 10% on the minus, since the index is the lower limit of the class) as the criterion of significance in a difference, we find that the wives are better adjusted than the husbands in

- 169 enjoy gatherings (*d* 18%)
- 25 interested, meeting people (*d* 16%)
- 209 interested, people met (*d* 12%)

which may be summarized as *social interest*.

The husbands are better adjusted than the wives in

- 3 stage fright (*d* 32%)
- 187 public speaking difficult (*d* 23%)
- 94 self-conscious at work (22%)
- 145 self-conscious in recitation (22%)
- 98 stand criticism (*d* 20%)
- 181 self-conscious with superiors (*d* 20%)
- 2 control temper (*d* 18%)
- 195 self-conscious over appearance (*d* 18%)
- 207 angry, let go (*d* 17%)
- 44 lose temper (*d* 13%)

- 112 stand kidding (*d* 13%)
- 196 help in accident (*d* 13%)
- 80 talk and regret (*d* 12%)

On account of the duplication of items these may be reduced to *fear of criticism* (actual or potential) (3, 187, 94, 145, 98, 181, 195, 112, 196), and *self-control* (2, 207, 44, 80).

The male students are better adjusted than the husbands in

- 72 nonconformity (*d* 28%)
- 150 meet important person (*d* 27%)
- 25 interested, meeting people (*d* 26%)
- 140 like companionship (*d* 26%)
- 196 help in accident (*d* 25%)
- 209 interested, people met (*d* 18%)
- 33 books more interesting (*d* 16%)
- 98 stand criticism (*d* 15%)
- 169 enjoy social gatherings (*d* 13%)
- 205 thought critical (*d* 12%)
- 30 keep in background (*d* 11%)
- 13 difficulty starting conversation (*d* 10%)

which may be characterized as *social interest* (150, 25, 140, 209, 33, 169), *fear of criticism* (196, 98, 30, 13), and *compensatory aggression* (72, 205). Besides the obvious possibility of error in categorizing, the duplication of *fear of criticism* on both sides of this division may lead to an inference of a certain degree of specificity with respect to the kind of criticism feared.

The husbands are better adjusted than the male students in

- 3 stage fright (*d* 25%)
- 195 self-conscious over appearance (*d* 18%)
- 161 hesitate in recitation (*d* 17%)
- 145 self-conscious in recitation (*d* 14%)
- 94 self-conscious at work (*d* 13%)
- 100 being watched (*d* 13%)
- 143 made fun of (*d* 13%)
- 181 self-conscious with superiors (*d* 13%)
- 187 public speaking difficult (*d* 12%)
- 18 social leader (*d* 11%)

all of which may be summarized as *fear of criticism*.

The female students are better adjusted than the wives in

- 72 nonconformity (*d* 37%)
- 98 stand criticism (*d* 33%)
- 150 meet important person (*d* 29%)
- 178 disturbed by criticism (*d* 27%)
- 196 help in accident (*d* 24%)
- 205 thought critical (*d* 21%)
- 10 introductions at party (*d* 20%)
- 25 interested, meeting people (*d* 18%)



- 112 stand kidding (*d* 18%)
- 3 stage fright (*d* 17%)
- 18 social leader (*d* 17%)
- 30 keep in background (*d* 16%)
- 91 allow crowding (*d* 15%)
- 209 interested, people met (*d* 14%)
- 207 angry, let go (*d* 14%)
- 157 different when young (*d* 12%)
- 145 self-conscious in recitation (*d* 12%)
- 28 feelings hurt (*d* 10%)
- 169 enjoy social gatherings (*d* 10%)

The wives are better adjusted than the women students in

- 140 like companionship (*d* 27%)
- 100 being watched (*d* 21%)
- 175 dislike writing about self (*d* 14%)
- 70 late, rather stand (*d* 14%)
- 80 talk and regret (*d* 21%)
- 119 thoughts being read (*d* 11%)
- 143 made fun of (*d* 11%)

The women students are better adjusted than the male students in

- 18 social leader (*d* 25%)
- 10 introductions at party (*d* 21%)
- 72 nonconformity (*d* 17%)
- 161 hesitate in recitation (*d* 15%)
- 169 enjoy social gatherings (*d* 15%)
- 98 stand criticism (*d* 12%)
- 3 stage fright (*d* 10%)
- 205 thought critical (*d* 10%)

The male students are better adjusted than the female students in

- 94 self-conscious at work (*d* 17%)
- 33 books more interesting (*d* 15%)
- 80 talk and regret (*d* 14%)
- 196 help in accident (*d* 14%)
- 2 control temper (*d* 13%)
- 100 being watched (*d* 12%)

*Physical.* The following 47 items refer to somatic phenomena:

- 5 Are you troubled much by constipation?
- 7 Have you ever had the habit of stuttering?
- 9 Does your heart sometimes sound in your ears so that you cannot sleep?
- 27 Have you ever had a nervous breakdown?
- 34 Are you frequently bothered by indigestion?
- 37 Do you ever feel an awful pressure in or about the head?
- 42 Can you sit still without fidgeting?
- 48 Do you usually feel fatigued when you wake up in the morning?
- 49 Can you stand disgusting smells?
- 50 Do you ever talk in your sleep?

- 56 Have you ever had an arm or leg paralyzed?  
 60 Did you ever have St. Vitus' dance?  
 62 Do you find it necessary to watch your health carefully?  
 66 Do you often have bad pains in any part of your body?  
 78 Have you ever had spells of dizziness?  
 82 Do you have a great many bad headaches?  
 87 Did you ever have convulsions?  
 88 Can you stand pain quietly?  
 90 Are you easily moved to tears?  
 93 Did you ever have heart trouble?  
 109 Do you have the sensation of falling when you go to sleep?  
 110 Do your eyes often pain you?  
 117 Do you feel tired most of the time?  
 132 Have you ever been blind, half-blind, deaf or dumb for a time?  
 133 Are you physically inferior to your associates?  
 135 Are you troubled with poor health?  
 144 Have you been bothered by vomiting?  
 152 Do you often feel just miserable?  
 154 Are you bothered much by blushing?  
 155 Is your head likely to ache on one side?  
 160 Are you frequently troubled with nightmares?  
 162 Do you usually feel well and strong?  
 163 Do you get tired of work quickly?  
 166 Do you usually sleep well?  
 176 Have you ever had the habit of twitching your face, neck, or shoulders?  
 179 Do you feel well rested in the morning?  
 189 Do you sometimes have shooting pains in the head?  
 191 Do you often have queer, unpleasant feelings in any part of your body?  
 198 Did you ever have anemia badly?  
 203 Do you often have the feeling of suffocating?  
 204 Have you any physical defects?  
 208 Do things ever swim or get misty before your eyes?  
 210 Have you a good appetite?  
 213 Are you bothered by fluttering of the heart?  
 216 Do you faint easily?  
 218 Since you were five years old have you ever had the habit of wetting the bed?  
 223 Do you ever walk in your sleep?

The percentages of each group answering each of these items in the maladjusted manner are:

	5	7	9	27	34	37	42	48	49	50
Husbands	15	7	4	5	19	3	21	21	23	27
Wives	18	2	10	16	16	10	26	33	39	25
Male students	12	6	10	2	15	11	30	27	38	24
Female students	12	7	12	3	11	12	25	17	60	22

	56	60	62	66	78	82	87	88	90	93
Husbands	1	3	22	9	20	6	1	24	30	11
Wives	2	3	25	17	28	14	3	25	68	9
Male students	1	0	18	17	38	6	3	15	18	7
Female students	2	1	27	17	39	8	3	17	49	7
	109	110	117	132	133	135	144	152	154	155
Husbands	11	9	11	3	5	5	1	14	10	5
Wives	22	11	22	1	11	11	9	17	11	13
Male students	10	34	20	2	12	4	3	31	14	8
Female students	27	22	19	1	3	1	10	46	28	13
	160	162	163	166	176	179	189	191	198	203
Husbands	3	11	13	9	11	28	3	4	3	1
Wives	8	20	38	10	7	37	9	12	15	5
Male students	5	13	25	3	10	30	10	12	1	3
Female students	4	8	21	7	7	15	10	13	3	6
	204	208	210	213	216	218	223			
Husbands	14	9	4	5	3	11	4			
Wives	13	13	3	9	5	5	3			
Male students	14	20	4	3	1	5	6			
Female students	10	19	12	10	2	1	7			

The above distribute as follows:

	0	5	10	15	20	25	30	35	40	45
Husbands	15	11	10	2	6	2	1	0	0	0
Wives	7	9	12	6	3	5	1	3	0	0
Male students	13	7	11	5	3	2	4	2	0	0
Female students	11	8	11	6	3	4	0	1	0	2
	50	55	60	65	M	$\sigma$				
Husbands	0	0	0	0	10.2	8.3				
Wives	0	0	0	1	15.6	12.4				
Male students	0	0	0	0	13.1	10.5				
Female students	0	0	1	0	14.5	13.0				

Separating the items into low, medium, and high incidence groups, as before, we have:

#### *Husbands*

*Low*—56 partly paralyzed (1%), 87 convulsions (1%), 144 vomiting (1%), 203 suffocating (1%), 37 pressure about head (3%), 60 St. Vitus' dance (3%), 132 temporary sensory loss (3%), 160 nightmares (3%), 189 shooting head pains (3%), 198 anemia (3%), 216 faint easily (3%), 9 heart beats banish sleep (4%), 191 unpleasant feelings (4%),

210 appetite (4%), 223 walk in sleep (4%), 27 nervous breakdown (5%), 133 physically inferior (5%), 135 poor health (5%), 155 lateral headache (5%), 213 heart fluttering (5%), 82 headaches (6%), 7 stuttering (7%), 66 bad pains (9%), 110 eyes pain (9%), 166 sleep well (9%), 208 things get misty (9%), 154 blushing (10%), 93 heart trouble (11%), 109 falling sensation (11%), 117 feel tired (11%), 162 feel well (11%), 176 twitching (11%), 218 wetting bed (11%), 163 tired, work (13%), 152 miserable (14%), 204 physical defects (14%), 5 constipation (15%), 34 indigestion (19%).

**Medium**—78 dizziness (20%), 42 sit still (21%), 48 fatigued in morning (21%), 62 watch health (22%), 49 stand smells (23%), 88 stand pain (24%), 50 talk in sleep (27%), 179 rested in morning (28%), 90 tears (30%).

#### *Wives*

**Low**—132 temporary sensory loss (1%), 7 stuttering (2%), 56 partly paralyzed (2%), 60 St. Vitus' dance (3%), 87 convulsions (3%), 210 appetite (3%), 223 walk in sleep (3%), 203 suffocating (4%), 216 faint easily (5%), 218 wetting bed (5%), 176 twitching (7%), 160 nightmares (8%), 93 heart trouble (9%), 144 vomiting (9%), 189 shooting head pains (9%), 213 heart fluttering (9%), 9 heart beats banish sleep (10%), 37 pressure about head (10%), 166 sleep well (10%), 110 eyes pain (11%), 133 physically inferior (11%), 135 poor health (11%), 154 blushing (11%), 191 unpleasant feelings (12%), 155 lateral headache (13%), 204 physical defects (13%), 208 things get misty (13%), 82 headaches (14%), 198 anemia (15%), 27 nervous breakdown (16%), 34 indigestion (16%), 66 bad pains (17%), 152 miserable (17%), 5 constipation (18%).

**Medium**—162 feel well (20%), 109 falling sensation (22%), 117 feel tired (22%), 50 talk in sleep (25%), 62 watch health (25%), 88 stand pain (25%), 42 sit still (26%), 78 dizziness (28%), 48 fatigued in morning (33%), 179 rested in morning (37%), 163 tired, work (38%), 49 stand smells (39%).

**High**—90 tears (68%).

#### *Male students*

**Low**—60 St. Vitus' dance (0), 56 partly paralyzed (1%), 198 anemia (1%), 216 faint easily (1%), 27 nervous breakdown (2%), 132 temporary sensory loss (2%), 87 convulsions (3%), 144 vomiting (3%), 166 sleep well (3%), 203 suffocating (3%), 213 heart fluttering (3%), 135 poor health (4%), 210 appetite (4%), 160 nightmares (5%), 218 wetting bed (5%), 7 stuttering (6%), 82 headaches (6%), 223 walk in sleep (6%), 93 heart trouble (7%), 155 temporary lateral

headache (8%), 9 heart beats banish sleep (10%), 109 falling sensation (10%), 176 twitching (10%), 189 shooting head pains (10%), 37 pressure about head (11%), 5 constipation (12%), 133 physically inferior (12%), 191 unpleasant feelings (12%), 162 feel well (13%), 154 blushing (14%), 204 physical defects (14%), 34 indigestion (15%), 88 stand pain (15%), 66 bad pains (17%), 62 watch health (18%), 90 tears (18%).

*Medium*—117 feel tired (20%), 208 things get misty (20%), 50 talk in sleep (24%), 163 tired, work (25%), 48 fatigued in morning (27%), 42 sit still (30%), 179 rested in morning (30%), 152 miserable (31%), 110 eyes pain (34%), 49 stand smells (38%), 78 dizziness (38%).

#### *Female students*

*Low*—60 St. Vitus' dance (1%), 132 temporary sensory loss (1%), 135 poor health (1%), 218 wetting bed (1%), 56 partly paralyzed (3%), 216 faint easily (2%), 27 nervous breakdown (3%), 87 convulsions (3%), 133 inferior physically (3%), 198 anemia (3%), 160 nightmares (4%), 203 suffocating (6%), 7 stuttering (7%), 93 heart trouble (7%), 166 sleep well (7%), 176 twitching (7%), 223 walk in sleep (7%), 162 feel well (8%), 82 headaches (8%), 144 vomiting (10%), 204 physical defects (10%), 213 heart fluttering (10%), 34 indigestion (11%), 5 constipation (13%), 9 heart beats banish sleep (12%), 37 pressure about head (12%), 210 appetite (12%), 155 lateral headache (13%), 191 unpleasant feelings (13%), 179 rested in mornings (15%), 48 fatigued in morning (17%), 66 bad pains (17%), 88 stand pain (17%), 117 feel tired (19%), 208 things get misty (19%).

*Medium*—163 tired, work (21%), 50 talk in sleep (22%), 110 eyes pain (22%), 42 sit still (25%), 62 watch health (27%), 109 falling sensation (27%), 154 blushing (28%), 78 dizziness (39%).

*High*—152 miserable (46%), 90 tears (49%), 49 stand smells (60%).

The differences between the groups, by items, are as follows:

	5	7	9	27	34	37	42	48	49	50	56	60
H—W	—3	5	—6	—11	3	—7	—5	—12	—16	2	—1	0
H—MS	3	1	—6	3	4	—8	—9	—6	—5	3	0	3
W—FS	6	—5	—2	13	5	—2	1	16	—21	3	0	2
MS—FS	0	—1	—2	—1	4	—1	5	10	—22	2	—1	—1
	62	66	78	82	87	88	90	93	109	110	117	132
H—W	—3	—8	—8	—8	—2	—1	—38	2	—11	—2	—11	2
H—MS	4	—8	—18	0	—2	9	12	4	1	—25	—9	1
W—FS	2	0	—11	6	0	8	19	2	—5	—11	3	0
MS—FS	—9	0	—1	—2	0	—2	—21	0	—17	12	1	1



	133	135	144	152	154	155	160	162	163	166	176	179
H—W	—6	—6	—8	—3	—1	—8	—5	—9	—25	—1	4	—9
H—MS	—7	1	—2	—17	—4	—3	—2	—2	—12	6	1	—2
W—FS	8	10	—1	—29	—17	0	4	12	17	3	0	22
MS—FS	9	3	—7	—15	—14	—5	1	5	4	—4	3	15

	189	191	198	203	204	208	210	213	216	218	223
H—W	—6	—8	—12	—4	1	—4	1	—4	—2	6	1
H—MS	—7	—8	2	—2	0	—11	0	2	2	6	—2
W—FS	—1	—1	12	—1	3	—6	—9	—1	3	4	—4
MS—FS	0	—1	—2	—3	4	1	—8	—7	—1	4	—1

These differences distribute as follows:

	—40	—35	—30	—25	—20	—15	—10	—5	0	5	10
H—W	1	0	0	1	1	5	13	15	9	2	0
H—MS	0	0	0	1	2	2	9	10	19	3	1
W—FS	0	0	1	1	1	2	2	10	17	5	4
MS—FS	0	1	0	1	1	2	4	16	16	3	2

	15	20	M	$\sigma$
H—W	0	0	—5.5	7.7
H—MS	0	0	—2.4	6.8
W—FS	3	1	1.1	9.6
MS—FS	1	0	—1.8	8.4

Adopting 10% as the criterion of significance in a difference, the wives are not better adjusted than the husbands in any item. The husbands are better adjusted than the wives in

- 90 tears (*d* 38%)
- 163 tired, work (*d* 25%)
- 49 stand smells (*d* 16%)
- 48 fatigued in morning (*d* 12%)
- 198 anemia (*d* 12%)
- 27 nervous breakdown (*d* 11%)
- 109 falling sensation (*d* 11%)
- 117 feel tired (*d* 11%)

The male students are better adjusted than the husbands in

- 90 tears (*d* 12%)

The husbands are better adjusted than the male students in

- 110 eyes pain (*d* 25%)
- 78 dizziness (*d* 18%)
- 152 miserable (*d* 17%)
- 163 tired, work (*d* 12%)
- 208 things get misty (*d* 11%)

The women students are better adjusted than the wives in the following items:

- 179 rested in morning (*d* 22%)
- 90 tears (*d* 19%)
- 163 tired, work (*d* 17%)
- 48 fatigued in morning (*d* 16%)
- 27 nervous breakdown (*d* 13%)
- 162 feel well (*d* 12%)
- 198 anemia (*d* 12%)
- 135 poor health (*d* 10%)

The wives are better adjusted than the women students in

- 152 miserable (*d* 29%)
- 49 stand smells (*d* 21%)
- 154 blushing (*d* 17%)
- 78 dizziness (*d* 11%)
- 110 eyes pain (*d* 11%)

The female students are better adjusted than the male students in

- 179 rested in morning (*d* 15%)
- 110 eyes pain (*d* 12%)
- 48 fatigued in morning (*d* 10%)

The male students are better adjusted than the female in

- 90 tears (*d* 31%)
- 49 stand smells (*d* 22%)
- 109 falling sensation (*d* 17%)
- 152 miserable (*d* 15%)
- 154 blushing (*d* 14%)

*Parental.* Eighteen items refer to attitudes toward family and parents (these are the same as Thurstone's items of the same category):

- 4 Have your relationships with your mother always been pleasant?
- 8 Do you get on well with your brothers and sisters?
- 22 Do you love your father more than your mother?
- 45 Is your mother's nature usually cheerful?
- 69 Were your parents partial to any of your brothers and sisters?
- 77 Were you your parents' favorite child?
- 81 Have your relationships with your father always been pleasant?
- 102 Has any of your family been insane, epileptic, or feeble-minded?
- 107 Have you been the scapegoat in the family life?
- 122 Were your parents happily married?
- 134 Has any of your family committed suicide?
- 147 Is your mother dissatisfied with her lot in life?
- 159 Do you love your mother more than your father?
- 165 Has any of your family had a drug habit?
- 188 Was your mother the dominant member of the family?
- 212 Is your home environment happy?
- 217 Has your family always treated you right?
- 221 Do you occasionally have conflicting moods of love and hate for members of your family?

The percentages of each sex answering each of these items in the maladjusted manner are:

	4	8	22	45	69	77	81	102	107
Husbands	25	8	15	20	11	20	21	4	3
Wives	37	11	20	28	12	27	22	5	4
Male students	13	8	8	10	8	23	21	1	3
Female students	8	6	7	10	5	18	8	1	3

	122	134	147	159	165	188	212	217	221
Husbands	22	1	27	25	2	38	7	9	16
Wives	28	3	31	19	1	49	5	14	37
Male students	5	3	11	32	2	24	9	1	12
Female students	6	1	12	32	0	26	3	3	31

The above distribute as follows:

	0	5	10	15	20	25	30	35	40
Husbands	4	3	1	2	4	3	0	1	0
Wives	3	2	3	1	2	3	1	2	0
Male students	5	5	4	0	3	0	1	0	0
Female students	6	6	2	1	0	1	2	0	0

	45	M	$\sigma$
Husbands	0	15.6	10.5
Wives	1	19.6	13.1
Male students	0	10.6	8.5
Female students	0	10.3	9.9

The items may be separated as before into low, medium, and high incidence groups, as follows:

#### *Husbands*

*Low*—134 family suicide (1%), 165 family drug habit (2%), 107 scapegoat in family (3%), 102 family abnormal (4%), 212 home happy (7%), 8 get on with siblings (8%), 217 treated right, family (9%), 69 parents partial (11%), 22 father loved more (15%), 221 love vs. hate for family (16%).

*Medium*—45 mother cheerful (20%), 77 parents' favorite (20%), 81 father relations pleasant (21%), 122 parents happy (22%), 4 mother relations happy (25%), 159 mother loved more (25%), 147 mother dissatisfied (27%), 188 mother dominant (38%).

#### *Wives*

*Low*—165 family drug habit (1%), 134 family suicide (3%), 107 scapegoat in family (4%), 102 family abnormal (5%), 212 home happy

(5%), 8 get on with siblings (11%), 69 parents partial (12%), 217 treated right, family (14%), 159 mother loved more (19%).

*Medium*—22 father loved more (20%), 81 father relations pleasant (22%), 77 parents' favorite (27%), 45 mother cheerful (28%), 122 parents happy (28%), 147 mother dissatisfied (31%), 4 mother relations pleasant (37%), 221 love vs. hate for family (37%).

*High*—188 mother dominant (49%).

#### *Male students*

*Low*—102 family abnormal (1%), 217 treated right, family (1%), 165 family drug habit (2%), 167 scapegoat in family (3%), 134 family suicide (3%), 122 parents happy (5%), 8 get on with siblings (8%), 22 father loved more (8%), 69 parents partial (8%), 212 home happy (9%), 45 mother cheerful (10%), 147 mother dissatisfied (11%), 221 love vs. hate for family (12%), 4 mother relations pleasant (13%).

*Medium*—81 father relations pleasant (21%), 77 parents' favorite (23%), 188 mother dominant (24%), 159 mother loved more (32%).

#### *Female students*

*Low*—165 family drug habit (0), 102 family abnormal (1%), 134 family suicide (1%), 212 home happy (3%), 217 treated right, family (3%), 107 scapegoat in family (3%), 69 parents partial (5%), 8 get on with siblings (6%), 122 parents happy (6%), 22 father loved more (7%), 4 mother relations pleasant (8%), 81 father relations pleasant (8%), 45 mother cheerful (10%), 147 mother dissatisfied (12%), 77 parents' favorite (18%).

*Medium*—188 mother dominant (26%), 221 love vs. hate for family (31%), 159 mother loved more (32%).

The differences between the groups, by items, are as follows:

	4	8	22	45	69	77	81	102	107	122	134
H—W	—12	—3	—5	—8	—1	—7	—1	—1	—1	—6	—2
H—MS	12	0	7	10	3	—3	0	3	0	17	—2
W—FS	29	5	13	18	7	9	14	4	1	22	2
MS—FS	5	2	1	0	3	5	7	0	0	—1	2
	147	159	165	188	212	217	221				
H—W	—4	6	1	—11	2	—5	—21				
H—MS	16	—7	0	14	—2	8	4				
W—FS	19	—13	1	23	2	11	6				
MS—FS	—1	0	2	—2	6	—2	—19				

These differences distribute as follows:

	-25	-20	-15	-10	-5	0	5	10	15	20	25
H—W	1	0	2	3	9	2	1	0	0	0	0
H—MS	0	0	0	1	3	7	2	3	2	0	0
W—FS	0	0	1	0	0	5	4	3	2	2	1
MS—FS	0	1	0	0	4	9	4	0	0	0	0

	M	$\sigma$
H—W	-4.9	6.28
H—MS	4.5	6.9
W—FS	9.3	9.3
MS—FS	.9	5.7

Adopting 10% as the criterion of significance of a difference, the wives are not better adjusted than the husbands in any item. The husbands are better adjusted than the wives in

- 221 love vs. hate for family (*d* 21%)
- 4 mother relations pleasant (*d* 12%)
- 188 mother dominant (*d* 11%)

The male students are better adjusted than the husbands in

- 122 parents happy (*d* 17%)
- 147 mother dissatisfied (*d* 16%)
- 188 mother dominant (*d* 14%)
- 4 mother relations pleasant (*d* 12%)
- 45 mother cheerful (*d* 10%)

The husbands are not better adjusted than the male students in any item.

The women students are better adjusted than the wives in the following:

- 4 mother relations pleasant (*d* 29%)
- 188 mother dominant (*d* 23%)
- 122 parents happy (*d* 22%)
- 147 mother dissatisfied (*d* 19%)
- 45 mother cheerful (*d* 18%)
- 81 father relations pleasant (*d* 14%)
- 22 father loved more (*d* 13%)
- 217 treated right, family (*d* 11%)

The wives are better adjusted than the women students in

- 159 mother loved more (*d* 13%)

The female students are not better adjusted than the male in any item.



The male students are better adjusted than the female in

221 love vs. hate for family (*d* 19%)

*Extroversion.* The following 17 items refer to the management of the non-human environment:

- 14 Do you lose your head easily in a dangerous situation?
- 20 Do you usually get turned around in new places?
- 32 Do you have the habit of leaving a lot of tasks unfinished?
- 38 Are you usually cool and composed in a dangerous situation?
- 46 Do you get rattled easily?
- 54 Do you get tired of amusements quickly?
- 59 Do you like indoor sports better than outdoor sports?
- 96 Do you like to take on responsibilities?
- 118 Do you have great difficulty in finding your way around in the dark?
- 121 Do you prefer participation in competitive intellectual amusements to athletic games?
- 146 Are you thrifty and careful about making loans?
- 167 Are you systematic in caring for your personal property?
- 170 Do you find our way about easily?
- 183 Would you rather work indoors or outdoors?
- 190 Do you like to solve puzzles?
- 192 Do you usually plan your work ahead?
- 200 Do you easily learn to find your way about in new places?

The percentages of each group answering each of these items in the maladjusted manner are:

	14	20	32	38	46	54	59	96	118
Husbands	8	22	36	17	13	26	13	30	6
Wives	18	43	38	26	25	16	24	43	8
Male students	8	30	38	12	11	32	10	21	10
Female students	12	31	19	17	21	26	14	26	16
	121	146	167	170	183	190	192	200	
Husbands	31	27	29	8	35	47	14	13	
Wives	45	25	36	22	38	47	24	28	
Male students	20	35	32	5	27	50	36	12	
Female students	33	12	19	12	22	31	19	15	

The above distribute as follows:

	5	10	15	20	25	30	35	40
Husbands	3	4	1	1	3	2	2	0
Wives	1	0	2	3	4	0	3	2
Male students	2	5	0	2	1	3	3	0
Female students	0	4	6	2	2	3	0	0

	45	50	M	$\sigma$
Husbands	1	0	22.0	12.0
Wives	2	0	29.6	11.2
Male students	0	1	23.8	12.9
Female students	0	0	20.2	7.1

The items may be separated into low, medium, and high incidence groups, as follows:

#### *Husbands*

*Low*—118 finding way, dark (6%), 14 lose head in danger (8%), 170 find way easily (8%), 46 rattled easily (13%), 59 like indoor sports (13%), 200 learn way easily (13%), 192 plan work ahead (14%), 38 cool in danger (17%).

*Medium*—20 get turned around (22%), 54 tire, amusements (26%), 146 thrifty about loans (27%), 167 systematic (29%), 96 like responsibilities (30%), 121 intellectual vs. athletic (31%), 183 rather work indoors (35%), 32 leave tasks unfinished (36%).

*High*—190 like puzzles (47%).

#### *Wives*

*Low*—118 finding way, dark (8%), 54 tire, amusements (16%), 14 lose head in danger (18%).

*Medium*—170 find way easily (22%), 59 like indoor sports (24%), 192 plan work ahead (24%), 46 rattled easily (25%), 146 thrifty about loans (25%), 38 cool in danger (26%), 200 learn way easily (28%), 167 systematic (36%), 32 leave tasks unfinished, (38%), 183 rather work indoors (38%), 20 get turned around (43%), 96 like responsibilities (43%).

*High*—121 intellectual vs. athletic (45%), 190 like puzzles (47%).

#### *Male students*

*Low*—170 find way easily (5%), 14 lose head in danger (8%), 59 like indoor sports (10%), 118 finding way, dark (10%), 46 rattled easily (11%), 38 cool in danger (12%), 200 learn way easily (12%).

*Medium*—121 intellectual vs. athletic (20%), 96 like responsibilities (21%), 183 rather work indoors (27%), 20 get turned around (30%), 54 tire, amusements (32%), 167 systematic (32%), 146 thrifty about loans (35%), 192 plan work ahead (36%), 32 leave tasks unfinished (38%).

*High*—190 like puzzles (50%).

*Female students*

**Low**—14 lose head in danger (12%), 146 thrifty about loans (12%), 170 find way easily (12%), 59 like indoor sports (14%), 200 learn way easily (15%), 118 finding way, dark (16%), 38 cool in danger (17%), 96 like responsibilities (17%), 32 leave tasks unfinished (19%), 167 systematic (19%), 192 plan work ahead (19%).

**Medium**—46 rattled easily (21%), 183 rather work indoors (22%), 54 tire, amusements (26%), 20 get turned around (31%), 190 like puzzles (31%), 121 intellectual vs. athletic (33%).

The differences between the groups, by items, are as follows:

	14	20	32	38	46	54	59	96	118	121	146
H—W	—10	—21	—2	—9	—12	10	—11	—7	—2	—14	2
H—MS	0	—8	—2	5	2	—6	3	9	—4	11	—8
W—FS	6	12	19	9	4	—10	10	17	—8	12	13
MS—FS	—4	—1	19	—5	—10	6	—4	—5	—6	—13	13
	167	170	183	190	192	200					
H—W	—7	—14	—3	0	—10	—15					
H—MS	—3	3	8	—3	—22	1					
W—FS	17	10	16	16	5	13					
MS—FS	13	—7	5	19	17	—3					

These differences distribute as follows:

	—25	—20	—15	—10	—5	0	5	10	15	M	$\sigma$
H—W	1	0	5	5	3	2	0	1	0	—7.1	7.7
H—MS	1	0	0	3	4	5	3	1	0	.9	7.9
W—FS	0	0	0	2	0	1	3	6	5	9.6	7.7
MS—FS	0	0	1	3	6	0	2	2	3	2.0	9.7

Adopting 10% as the criterion of significance of a difference, as before, the wives are better adjusted than the husbands in

54 tire, amusements (*d* 10%)

The husbands are better adjusted than the wives in

20 get turned around (*d* 21%)  
 200 learn way easily (*d* 15%)  
 121 intellectual vs. athletic (*d* 14%)  
 170 find way easily (*d* 14%)  
 46 rattled easily (*d* 12%)  
 59 like indoor sports (*d* 11%)

The male students are better adjusted than the husbands in

121 intellectual vs. athletic (*d* 11%)

The husbands are better adjusted than the male students in

192 plan work ahead (*d* 22%)

The female students are better adjusted than the wives in the following

32 leave tasks unfinished (*d* 19%)

96 like responsibilities (17%)

167 systematic (*d* 17%)

183 rather work indoors (*d* 16%)

190 like puzzles (*d* 16%)

146 thrifty about loans (*d* 13%)

200 learn way easily (*d* 13%)

20 get turned around (*d* 12%)

121 intellectual vs. athletic (*d* 12%)

59 like indoor sports (*d* 10%)

170 find way easily (*d* 10%)

The wives are not better adjusted than the female students in any item.

The female students are better adjusted than the male in

32 leave tasks unfinished (*d* 19%)

190 like puzzles (*d* 19%)

192 plan work ahead (*d* 17%)

146 thrifty about loans (*d* 13%)

167 systematic (*d* 13%)

The male students are better adjusted than the female in

121 intellectual vs. athletic (*d* 13%)

*Sex.* Ten items (following Thurstone) have been differentiated out as referring to sexual attitudes. They are:

29 Are you easily shocked by sexual topics, risqué stories, and the like?

68 Have you ever been afraid that you are sexually inferior to other men (other women)?

95 Do you limit your friendships mostly to your own sex?

125 Would you say that you are more or less ignorant of sex?

128 Would you say that you are cynical about members of the opposite sex generally?

130 Do you find it difficult to pass urine in the presence of others?

137 Is there a conflict in your nature between sex and morality?

171 Are you shy with boys?

172 Are you shy with girls?

222 Are you generally regarded as indifferent to the opposite sex?

Following are the percentages of the total population answering each of these items in the maladjusted manner:

	29	68	95	125	128	130	137	171	172	222
Husbands	6	22	16	5	7	19	8	6	9	14
Wives	14	10	26	6	5	23	5	12	11	17
Male students	2	15	26	8	23	23	22	1	21	15
Female students	10	12	25	16	19	17	10	20	8	28

The above distribute as follows:

	0	5	10	15	20	25	M	$\sigma$
Husbands	0	6	1	2	1	0	11.0	5.4
Wives	0	3	4	1	1	1	13.5	6.3
Male students	2	1	0	2	4	1	16.0	8.6
Female students	0	1	3	3	1	2	17.0	6.3

Separating the items into incidence groups yields the following:

#### *Husbands*

*Low*—125 ignorant of sex (5%), 29 easily shocked (6%), 171 shy with boys (6%), 128 cynical, opposite sex (7%), 137 sex vs. morality (8%), 172 shy with girls (9%), 222 indifferent, opposite sex (14%), 95 friendships, own sex (16%), 130 difficult urination (19%).

*Medium*—68 sexually inferior (22%).

#### *Wives*

*Low*—128 cynical, opposite sex (5%), 137 sex vs. morality (5%), 125 ignorant of sex (6%), 68 sexually inferior (10%), 172 shy with girls (11%), 171 shy with boys (12%), 29 easily shocked (14%), 222 indifferent, opposite sex (17%).

*Medium*—130 difficult urination (23%), 95 friendships, own sex (26%).

#### *Male students*

*Low*—171 shy with boys (1%), 29 easily shocked (2%), 125 ignorant of sex (8%), 68 sexually inferior (15%), 222 indifferent, opposite sex (15%).

*Medium*—172 shy with girls (21%), 137 sex vs. morality (22%), 128 cynical, opposite sex (23%), 130 difficult urination (23%), 95 friendships, own sex (26%).

#### *Female students*

*Low*—172 shy with girls (8%), 29 easily shocked (10%), 137 sex vs. morality (10%), 68 sexually inferior (12%), 125 ignorant of sex (16%), 130 difficult urination (17%), 128 cynical, opposite sex (19%).

*Medium*—171 shy with boys (20%), 95 friendships, own sex (25%), 222 indifferent, opposite sex (28%).

The differences between the groups, by items, are as follows:

	29	68	95	125	128	130	137	171	172	222
H—W	—8	12	—10	—1	2	—4	3	—6	—2	—3
H—MS	4	7	—10	—3	—16	—4	—14	5	—12	—1
W—FS	4	2	1	—10	—14	6	—5	—8	3	—9
MS—FS	—8	3	1	—8	4	6	12	—19	13	—13



These differences distribute as follows:

	-20	-15	-10	-5	0	5	10	M	$\sigma$
H—W	0	0	3	4	2	0	1	-2.0	5.8
H—MS	1	2	1	3	1	2	0	-4.5	8.3
W—FS	0	1	3	1	4	1	0	-2.5	6.1
MS—FS	1	1	2	0	3	1	2	-1.0	9.8

Adopting 10% as the criterion of significance in a difference, the wives are better adjusted than the husbands in

68 sexually inferior (*d* 12%)

The husbands are not better adjusted in any item.

The male students are not better adjusted than the husbands in any item.

The husbands are better adjusted than the male students in

128 cynical, opposite sex (*d* 16%)

137 sex vs. morality (*d* 14%)

172 shy with girls (*d* 12%)

The female students are not better adjusted than the wives in any item.

The wives are better adjusted than the female students in

128 cynical, opposite sex (*d* 14%)

The female students are better adjusted than the male students in

172 shy with girls (*d* 13%)

137 sex vs. morality (*d* 12%)

The male students are better adjusted than the female students in

171 shy with boys (*d* 19%)

222 indifferent, opposite sex (*d* 13%)

## SUMMARY

The distributions of percentages of each group answering items in each category in the maladjusted manner may be summarized as follows: largest, smallest, and intermediate critical ratios are given on page 491.

Fa So Ph Pa Ex Sx	14	11	18	10	8	4	2	4	1	3	1	14.3
	5	7	3	7	2	7	6	12	5			26.6
	15	11	10	2	6	2	1					10.2
	4	3	1	2	4	3		1				15.6
		3	4	1	1	3	2	2		1		22.0
Sx	6	6	1	2	1							11.0
Largest (So-Ph) = 7.0 Smallest (Ph-Sx) = .4 Intermediate (Fa-Ex) = 2.5												
Fa So Ph Pa Ex Sx	5	10	9	12	10	9	6	6	2	1	2	21.0
	4	7	5	4	5	7	4	4	5	4	4	29.5
	7	9	12	6	3	5	1	3			1	15.6
	3	2	3	1	2	3	1	2		1	1	19.6
		1	3	2	3	4	3	3	2	2		29.6
Sx	3	3	4	1	1	1						13.5
Largest (Ex-Sx) = 4.8 Smallest (Ex-So) = .02 Intermediate (Fa-Ex) = 2.8												
Fa So Ph Pa Ex Sx	9	14	4	5	10	10	8	2	3	4	1	21.5
	2	3	10	10	7	6	5	4	3	5	4	25.7
	13	7	11	5	3	2	4	2			1	13.1
	5	5	4		3	1	1					10.6
		2	5	2	2	1	3	3			1	23.7
Sx	2	1		2	4	1						16.0
Largest (So-Pa) = 5.5 Smallest (Ex-So) = .5 Intermediate (Ex-Sx) = 1.8												
Fa So Ph Pa Ex Sx	5	9	14	10	9	4	5	6	3	5	0	21.9
	3	5	7	12	9	3	6	3	4	3	3	24.5
	11	8	11	6	3	4	0	1	0	2	0	14.5
	6	6	2	1	0	1	2				1	10.3
		1	4	6	2	2	2	3				20.2
Sx			3	3	1	2						17.0
Largest (So-Pa) = 4.9 Smallest (Fa-Ex) = .7 Intermediate (Fa-Ph) = 2.9												

The following arrangement will exhibit the rank order of the categories in the four groups:

Husbands	Wives	Male students	Female students
Social	Extrovert	Social	Social
Extrovert	Social	Extrovert	Fantasy
Parental	Fantasy	Fantasy	Extrovert
Fantasy	Parental	Sex	Sex
Sex	Physical	Physical	Physical
Physical	Sex	Parental	Parental

We may summarize those items having an incidence of 50% or over, without regard to category:

*Husbands*—150 meet important person (74%), 72 nonconformity (64%).

*Wives*—150 meet important person (76%), 90 tears (68%), 3 stage fright (67%), 187 public speaking difficult (59%), 16 worry over humiliation (57%), 24 afraid of falling (57%), 181 self-conscious with superiors (57%), 72 nonconformity (56%), 80 talk and regret (55%), 145 self-conscious in recitation (54%), 196 help in accident (52%), 98 stand criticism (50%), 91 allow crowding (50%).

*Male students*—3 stage fright (60%), 73 day-dream frequently (59%), 124 depressed, low marks (55%), 80 talk and regret (53%), 18 social leader (50%), 181 self-conscious with superiors (50%), 190 like puzzles (50%), 16 worry over humiliation (50%).

*Female students*—80 talk and regret (67%), 31 ideas banish sleep (61%), 49 stand smells (60%), 73 day-dream frequently (59%), 94 self-conscious at work (54%), 3 stage fright (50%), 187 public speaking difficult (50%).

The husband minus wife difference distributions may be displayed by category as follows:

	—40	—35	—30	—25	—20	—15	—10	—5	0	5	10	15	M
Fa				4	6	17	10	19	10	6			—6.9
So		1		3	5	4	5	14	17	7	1	2	—3.4
Ph	1			1	1	5	13	15	9	2			—5.5
Pa				1		2	3	9	2	1			—4.9
Ex				1		5	5	3	2		1		—7.1
Sx							3	4	2		1		—2.0

The wives are not better adjusted than the husbands in any item to

the extent of a difference of 20%; the husbands are better adjusted than the wives by more than this amount in

Fantasy—	194	frightened by lightning ( <i>d</i> 25%)
	52	feelings alternate ( <i>d</i> 23%)
	220	confident about abilities ( <i>d</i> 21%)
	24	afraid of falling ( <i>d</i> 21%)
Social—	3	stage fright ( <i>d</i> 32%)
	187	public speaking difficult ( <i>d</i> 23%)
	94	self-conscious at work ( <i>d</i> 22%)
	145	self-conscious in recitation ( <i>d</i> 22%)
Physical—	90	tears ( <i>d</i> 38%)
	163	tired, work ( <i>d</i> 25%)
Parental—	221	love vs. hate for family ( <i>d</i> 21%)
Extrovert—	20	get turned around (21%)

The husbands minus male student difference distributions may be displayed by category as follows:

	—40	—35	—30	—25	—20	—15	—10	—5	0	5	10	15	20	25	M
Fa	1	1	3	3	6	7	11	20	12	7	1				—6.7
So				1	2	7	9	10	9	9	4	3		5	1.1
Ph				1	2	2	9	10	19	3	1				—2.5
Pa							1	3	7	2	3	2			4.5
Ex				1			3	4	5	3	1				— .9
Sx					1	2	1	3	1	2					—4.5

The students are better adjusted than the husbands to the extent of a difference of 20% or more in

Social—	72	nonconformity ( <i>d</i> 28%)
	150	meet important person ( <i>d</i> 27%)
	25	interested, meeting people ( <i>d</i> 26%)
	140	like companionship ( <i>d</i> 26%)
	196	help in accident ( <i>d</i> 25%)

The husbands are better adjusted than the male students by more than 20% in

Fantasy—	124	depressed, low marks ( <i>d</i> 38%)
	177	loneliness ( <i>d</i> 33%)
	21	lonesome ( <i>d</i> 30%)
	52	feelings alternate ( <i>d</i> 30%)
	85	interests change ( <i>d</i> 30%)
	151	not old self ( <i>d</i> 24%)
	73	day-dream frequently ( <i>d</i> 23%)
	153	particular useless thought ( <i>d</i> 22%)
Social—	3	stage fright ( <i>d</i> 25%)
Physical—	110	eyes pain ( <i>d</i> 25%)
Extrovert	192	plan work ahead ( <i>d</i> 22%)

The wife minus female student difference distributions may be displayed by category as follows:

	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35	M
Fa	2	3	4	2	13	11	13	12	8	3	1				-1.1
So	1	1	0	5	7	8	10	8	6	6	3	2	1	1	4.1
Ph	1	1	1	2	2	10	17	5	4	3	1				1.0
Pa				1	0	0	5	4	3	2	2	1			9.2
Ex					2	0	1	3	6	5					9.6
Sx				1	3	1	4	1							-2.5

The female students are better adjusted than the wives in

Fantasy—	184	lack of self-confidence ( <i>d</i> 22%)
Social—	72	nonconformity ( <i>d</i> 37%)
	98	stand criticism ( <i>d</i> 33%)
	150	meet important person ( <i>d</i> 29%)
	178	disturbed by criticism ( <i>d</i> 27%)
	196	help in accident ( <i>d</i> 24%)
	205	thought critical ( <i>d</i> 21%)
	10	introductions at party ( <i>d</i> 20%)
Physical—	179	rested in morning ( <i>d</i> 22%)
Parental—	4	mother relations pleasant ( <i>d</i> 29%)
	188	mother dominant ( <i>d</i> 23%)
	122	parents happy ( <i>d</i> 22%)

The wives are better adjusted than the female students in

Fantasy—	31	ideas banish sleep ( <i>d</i> 27%)
	148	things go wrong ( <i>d</i> 27%)
	151	not old self ( <i>d</i> 23%)
	73	day-dream frequently ( <i>d</i> 22%)
	197	need to repeat ( <i>d</i> 22%)
Social—	140	like companionship ( <i>d</i> 27%)
	100	being watched ( <i>d</i> 21%)
Physical—	152	miserable ( <i>d</i> 29%)
	49	stand smells ( <i>d</i> 21%)

The male student minus the female student difference distributions may be displayed by category as follows:

	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	M
Fa			1	2	9	9	13	17	12	5	3		1	— .4
So				1	5	4	7	25	9	3	3	1	1	1.9
Ph		1		1	2	4	16	16	3	2	1			-1.8
Pa				1	0	0	4	9	4					.9
Ex					1	3	6		2	2	3			2.0
Sx				1	1	2		3	1	2				-1.0



The female students are better adjusted than the male in

Fantasy—	75	impulse to steal ( <i>d</i> 28%)
Social—	18	social leader ( <i>d</i> 25%)
	10	introductions at party ( <i>d</i> 21%)

The male students are better adjusted than the female in

Fantasy—	92	dread snake ( <i>d</i> 21%)
Physical—	90	tears ( <i>d</i> 31%)
	49	stand smells ( <i>d</i> 22%)

The sum of the above material may be stated in rather different form while at the same time adding new interpretative information by extracting "male," "female," "married," and "single" items. Thus a male item will be one in which an incidence for the husband exceeds by some large amount that for the wife and in which also that of the male student greatly exceeds that for the female student. Thus a male item will be one in which males are especially prone to maladjustment, and correspondingly for the other three groups. We may take as a criterion of difference an excess of 10%; this corresponds to odds of about 99 to 1 in favor of a true difference. The four groups of items extracted on this basis are given below with the respective differences in per cent.

			<i>Male Items</i>		%	
			H-W	MS-FS		
Social—	169	enjoy social gatherings	18	15		[Also] married
			<i>Female Items</i>		%	
Fantasy—	24	afraid of falling	21	11		
	63	frightened in night	12	13		
	92	dread snake	17	21		
	114	fear of fire	12	14		
	136	excitement	15	18		
	151	not old self	11	10		single
	194	frightened by lightning	25	15		
	199	uneasy crossing street	13	14		
	220	confident about abilities	23	11		
Social—	2	control temper	15	13		
	80	talk and regret	12	14		single
	94	self-conscious at work	22	17		
	196	help in accident	13	14		married
Physical—	49	stand smells	16	22		
	90	tears	38	31		married
	109	falling sensation	11	17		
Parental—	221	love vs. hate for family	21	19		
Extrovert—	46	rattled easily	12	10		
	121	intellectual vs. athletic	14	13		married

*Married Items*

			$\%$		
			H-MS	W-FS	[Also]
Fantasy—	113	absent minded	11	17	
Social—	25	interested, meeting people	26	18	
	30	keep in background	11	16	
	72	nonconformity	28	37	
	98	stand criticism	15	33	
	150	meet important person	27	29	
	169	enjoy social gatherings	13	10	male
	196	help in accident	25	24	female
	205	thought critical	12	21	
	209	interested, people met	18	14	
Physical—	90	tears	12	19	female
Parental—	4	mother, relations pleasant	12	29	
	45	mother cheerful	10	18	
	122	parents happy	17	22	
	147	mother dissatisfied	16	19	
	188	mother dominant	14	23	
Extrovert—	121	intellectual vs. athletic	11	12	female

*Single Items*

			$\%$		
			H-MS	W-FS	[Also]
Fantasy—	21	lonesome	30	20	
	35	things unreal	12	17	
	73	day-dream frequently	23	22	
	85	interests change	30	11	
	124	depressed, low marks	38	16	
	148	things go wrong	19	27	
	151	not old self	24	23	female
	153	particular useless thought	22	10	
	186	unlucky	16	14	
Social—	80	talk and regret	10	12	female
	100	being watched	13	21	
	143	made fun of	13	11	
Physical—	78	dizziness	18	11	
	110	eyes pain	25	11	
	152	miserable	17	29	
Sex—	128	cynical, opposite sex	16	14	

No summary can give as adequate qualitative impression as an examination of the items themselves. The fact that only one item occurs in the male group is conspicuous, as is also the predominance of fantasy items in the female and single groups and that of the social category in the married group.

The above material provides a large amount of food for reflection. In the summaries of incidence distributions by categories and classes of subjects we may observe that the large incidences pertain almost

exclusively to the social and fantasy categories. The significance of this has been shown elsewhere (6); it is that these categories represent the real essence of the entire scale, the trait of "neuroticism" being conceivable as a fantasy and social maladjustment with some somasthenic aspects. Curiously, the parental and sex categories have very little to do with maladjustment, which finding may be a consequence of the small number of items in these categories and also of the relative inaccuracy of report. The extrovert category is exceptional so far as incidence is concerned. Very large ranges of incidence characterize the distributions of the social and fantasy categories, while the extrovert, although having a high average, shows a reduced variability. The average may be high partly because of a certain unrepresentativeness; for example, a good many people (31-50%) dislike puzzles, but their dislike for puzzles correlates rather poorly, as compared with other items (.36), with neuroticism as a whole.

The rank orders of the mean incidences of the categories for the different classes show interesting similarities and differences. The students are very much alike, without regard to sex—a fact especially striking inasmuch as they come from regions some 1200 to 1500 miles apart and probably have somewhat different general cultural backgrounds. There is only one reversal between them, and that only of one rank, viz, that between Fantasy and Extrovert in ranks 2 and 3. The husbands and wives are again very similar. Their orders show three reversals of one rank each. The husbands and wives are therefore slightly less alike than the male and female students, but each member of each pair of opposite-sex classes is more like the other than it is like the same-sex member of the other pair. The two differences which are most striking are: (1) the sex maladjustments of the students are relatively more important than those of the married couples—a finding which may be comprehensible; and (2) the parental maladjustments of the students are least important of all for them, while for the husbands and wives this category holds a middle rank. It may be supposed that the students are (by reason of being students) psychically farther from their parents and better shielded from their influence than at almost any other time in life, while the married couples find themselves in habits of life which chronically remind them of their earlier family associations.

The specific difficulties of most frequent occurrence with the husbands may perhaps be described as *social resistance*. Those of the

wives are a rather miscellaneous group, for which it is difficult to find a brief description; perhaps a *social apprehensiveness* or *fear of people* may cover the ground. The height phobia (24) is perhaps to be understood as symbolic. The male students are most troubled by social matters of the same sort, but there also appears in them a tendency toward an increased inner tension, as manifested by day-dreams, depressions, and the persistence of humiliating memories. The female students manifest more frequently the usual social difficulties, with a slight tendency toward the same inner tension manifested by the boys. As in previous analysis, male and female students are very similar in their maladjustments, while wives are much more miscellaneous in their difficulties and show a great many more very frequent difficulties than do the husbands.

The greatest average superiority of the husbands' adjustment is seen to be in the Extrovert category, with Fantasy, Physical, and Parental following closely behind. There is little difference in sex and social maladjustment.

With respect to husband-wife differences in specific items, the husband's superiority appears to be spread over more of the categories, especially Fantasy and Social. No summary description has been found which will convey the specific differences better than an examination of the items themselves.

The students, as has been observed in another connection, are better adjusted, on the average, in Parental and Social categories than are the husbands. Of those categories in which the husbands are superior, the superiority is most marked in Fantasy and Sex. These matters are more evident in the examination of specific items.

The husband-male-student differences are probably best ascribed to differences in development. On this basis it appears that increase in age leads to a dropping out of instabilities of mood and fantasy, loneliness, and some undesirable work habits; on the other hand, it appears that the student is more socially extroverted than he probably will be later, and has a more genuine interest in other personalities.

The superiority of the married to the single men is reversed in the case of the women. The two categories in which the wife shows superiority are those of Fantasy and Sex (these being also the cases where the husbands' superiority to the male students was most pronounced); a very marked superiority of the student women over the wives shows up in parental and extrovert categories, and the social superiority is moderate.

Development in the women, even more than in the men, appears to make chiefly for the dropping out of internal tensions, as in the feeling of being watched and general misery, but the students again (as with the men) seem to have a happier, more extroverted relationship to their environment than do the wives.

The differences between male and female students are extraordinarily small, the largest being for the Extrovert and Social categories (showing a superior adjustment for the females) and the Physical category (showing the superiority in the reverse direction). Since only three items showing more than 20% difference in each direction appear, no characterization is likely to improve upon the examination of these items themselves.

(To be continued)

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# PERSONAL HISTORY, INTELLIGENCE, AND ACADEMIC ACHIEVEMENT\*

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## INTRODUCTION

The following study represents another attack upon the problem of measuring and evaluating personal history. This study differs from previous attempts in two respects: first, Laird's Personal Inventory schedules (7) have used the rating scale technique but do not include as extensive a survey of the subject of personal history as the present schedule; second, Thurstone's (9) and Bernreuter's (1) personality schedules have used the three-category type of response, "Yes," "No," "?," rather than the "Yes," "No" answer. Both Bernreuter and Thurstone have used a large number of questions in the personal history inventories, Thurstone including 223 items and Bernreuter, 125. Form I of the Personal History Record<sup>1</sup> contains 99 items which have been gathered from various sources and arranged in the form of a graphic rating scale. Most of these questions were derived from the Chassel and Watson Emotional History Record (2). Form II contains a list of 70 questions to which the subject answers "Yes" or "No." These items are similar to those of the Woodworth-Wells Psychoneurotic Inventory. The chief difference between Form II and other schedules employing the same method of listing the subject's response is in the method of scoring and evaluating the significance of each item. The value of this approach may be determined from the study of the data.

## FORM I

In spite of the many disadvantages of the rating scale technique, it has one distinct advantage in that it does not compel the subject to classify himself in only one of two categories. The items in

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<sup>1</sup>Copies of the record blanks will gladly be sent by the author to anyone requesting them.

Form I were arranged as questions with descriptive adjectives placed at various intervals along the line on which the subject checked the part most descriptive of himself. In random order the arrangement of adjectives along the line was reversed to avoid a "halo" effect.

In scoring, each line was divided into 10 equal parts and simple numerical values from 1 to 10 were given to each space. A value of 1 was always given to the end of the line which represented the most stable form of the trait rated. For example, in question 1, "Do you sleep poorly?" the descriptive adjectives appearing along the line are "never, seldom, occasionally, usually, most of the time." If the person checks "never" at the extreme end of the line, the value assigned is 1. If he checks the other extreme end of the line, "most of the time," the value is 10. This, interpreted, would mean that insomnia would be the most unstable form of trait which deals with the manner in which one sleeps. The interpretation, then, throughout the scale is that a low score indicates stability and a high score instability. The use of such a criterion of either stability or instability is for convenience, and is tentative.

There are two basic assumptions, however, which are made in using a scale of this sort: first, that each item is important to the extent that its numerical value is high and approaches the unstable extreme; second, that the person having the higher total score would tend to be emotionally unstable and the one having a low score would tend to be emotionally apathetic. The validity of these assumptions will have to be determined in terms of the use and practical utility of the scale.

The most convenient method found for us in scoring Form I of the Personal History Record was to use a celluloid stencil in which each line was divided into 10 equal parts. The scorer then marked the number of the space in which the check mark appeared, in the margin. The value of the check marks was written in the right-hand margin of each question. Red lines and stars were used to indicate those questions in which the descriptive adjectives appear in reverse order. A score on Form I, then, is simply the addition of the values on the 99 questions.

## FORM II

Form II is a continuation of the personal history record of the individual. These questions are of a definite personal nature which

are more adapted to the "Yes," "No" type of response. The subject was instructed to encircle "Yes" if it were the answer which best described him, and to encircle "No" if that were the more appropriate answer. In scoring, these items were tabulated separately and the frequency of "Yes" and "No" replies totaled for each item. The items were in turn weighted according to their uniqueness (3).

The assumptions in this scoring method are: (1) only those items are significant in which people differ; (2) the more unique the reply, the greater shall be the assigned score weight. An item in which people are approximately equally divided with respect to "Yes" and "No" replies is insignificant.

This second assumption is rather difficult to justify on logical grounds but has been widely used in the development of many schedules. The justification of the use of any schedule lies in the fact that a considerable number of items are used. Thus, it is expected that bizarre weights may tend to cancel each other, thereby giving a somewhat balanced picture of the individual.

The formula for determining the scoring weights for each item is,

$$\sigma_{p_1 - p_2} = \sqrt{\sigma_{p_1}^2 + \sigma_{p_2}^2 - 2r_{p_1 p_2} \sigma_{p_1} \sigma_{p_2}} \quad [1]$$

where

$p_1$  is the proportion of responses "Yes,"

$p_2$  is the proportion of responses "No,"

$r_{p_1 p_2}$  is the correlation of  $p_1$  and  $p_2$ , necessarily since

$p_1$  and  $p_2$  are complementary; therefore,  $\sigma_{p_1} = \sigma_{p_2}$ .

Thus [1] reduces to  $\sigma_{p_1 - p_2} = \sqrt{\sigma_{p_1}^2 + \sigma_{p_2}^2 + 2.00(\sigma_{p_1} \sigma_{p_2})}$  [2]

$$\sigma_{p_1 - p_2} = \sigma_{p_1} + \sigma_{p_2} \quad [3]$$

and

$$\sigma_{p_1 - p_2} = 2\sigma_{p_1} \quad [4]$$

All items in the test, Form II, were weighted according to the formula here developed.

Formula 1, prepared from Edgerton's (3) tables, shows in detail the method of weighting. The optimal weighting is equal to the percentage difference of the "Yes" and "No" replies divided by  $2\sigma_p$ . If the item were answered 50 per cent of the time "Yes," then from Edgerton's tables the value of  $2\sigma_p$  for, say, 35 cases is 17.0. The

difference or D value is 0. Such an item is consequently given a weighting of 0. If the item, for example, is answered "Yes" 30 per cent of the time and "No" 70 per cent of the time, the value of  $2\sigma_p$  for 35 cases and the D value are determined. Then  $D/2\sigma_p$  yields the optimal weight value for such an item.

### RELIABILITY AND VALIDITY

The statistical reliability of the Personal History Record will be determined and reported in a subsequent study. It is evident, however, that a high degree of reliability is inherent in the schedule since it contains 161 items and is long enough to get a fair measure of personal traits.

The validity of the Personal History Record has not been determined since there are no adequate criteria of validity other than either definition or internal consistency. In this respect it shares the common weakness of all such schedules. Since many of the items are similar to those in the Thurstone Personality Schedule and the Bernreuter Personality Inventory, one would expect it to correlate highly with such other schedules. This comparison will be made and reported subsequently.

### DATA

The point-hour ratios for the first and second semesters represent a measurement of all grades received in which "A" counts 4 points, "B" 3, "C" 2, "D" 1, and "F" 0. The intelligence centile scores were taken from Ohio College Association norms, all students in this study taking Form 17. The scores for Forms I and II were computed in the manner described above, the total number of the raw scores for freshman men at Ohio Wesleyan University ranging from 148 to 419, for the women from 152 to 490. The correlation of Forms I and II with certain other variables appears in Table 1 below. The means and sigmas of the raw scores of the different variables also appear at the bottom of the table. N is stated for both men and women.

The correlation of Form I with scholarship (point-hour ratio) for the women is .0115 for the first semester. The correlation between Form I and second semester scholarship is .0356, and the correlation with the Ohio College Association intelligence tests is

TABLE 1  
INTERCORRELATIONS BETWEEN PERSONAL HISTORY RECORD SCORES AND  
CERTAIN OTHER VARIABLES

	Form I	1st sem. P/H	2nd sem. P/H	Intell. cent.	Form II
Women					
Form I		.0115	.0356	— .1111	.426
1st sem. P/H	.0115		.761	.5439	— .0798
2nd sem. P/H	.0356	.761		.5058	.0242
Intell. cent.	— .1111	.5439	.5058		.0402
Form II	.426	— .0798	.0242	.0402	
Mean	293.89	2.62	2.78	58.39	29.74
Sigma	52.44	.59	.569	27.104	27.028
N=160					
Men					
Form I		.0925	.0931	.0647	.412
1st sem. P/H	.0925		.6764	.4822	.1182
2nd sem. P/H	.0931	.6764		.342	.0226
Intell. cent.	.0647	.4822	.342		— .0277
Form II	.412	.1182	.0226	— .0277	
Mean	267.48	2.77	2.341	57.155	46.74
Sigma	60.927	.7225	.7325	28.0388	15.859
N=116					

— .1111. Form II correlations with the point-hour ratios are — .0798 and .0242. Similar data for men are also found in Table 1.

Forms I and II correlate at .426 for the women and at .412 for the men, indicating that there is a considerable amount of overlapping in whatever factor either or both forms measure.

### DISCUSSION

The low correlations here found between scores on Forms I and II and such variables as scholarship and intelligence test scores suggest that the Personal History Record measures a set of factors not measured by these variables. The exact meaning and significance of this is difficult to determine at present, but it does offer hope for the construction of tests which may ultimately prove to be of value in the analysis of that nebulous quality termed personality or character.

The chief value at present of the Personal History Record is its use for diagnostic personnel work. The value in this respect, however, is largely on the basis of testimony and little on the basis of experimental data. The schedule offers a ready means for deter-



mining the instability of an individual and suggests in this way the situations in which he would be best adapted.

The Personal History Record has been found to be quite diagnostic in dealing with individual cases. This value, however, seems to come as a result of clinical evaluation rather than from the numerical score. That is, while numerical scores may be regarded as indications of instability, they do not adequately represent the comparative seriousness of the underlying tendencies. The general picture represented by the numerical score might result from any form of instability. An analysis of individual items of the schedule is important for clinical treatment. It would seem that any instrument which primarily involves the use of a raw score as a measure of instability or personality adaptation will not be entirely satisfactory in the adjustment of the individual case.

The lack of substantial correlation of the Personal History Record with either scholarship or intelligence is in agreement with the results reported by Bernreuter (1) and Stagner (8). It has also been observed that the raw scores obtained on the personality schedules do not satisfactorily explain the reasons why students do well or poorly in their work. The results of Thurstone (9) indicate that those students who are most maladjusted tend to be better students. Examination of the present data will not corroborate such a conclusion. Since different investigators seem to obtain conflicting results, it would seem that the real causes have not been adequately determined.

The lack of agreement between scores on the personality schedules or inventories with variables such as scholarship and intelligence may be due in part to the fact that there are many factors which determine the trend of one's personality. Since the interaction of these forces does not necessarily cancel out, there is always the possibility of a single difficulty playing a major rôle which, compared to the total number of tendencies, seems unimportant. This condition is likely to result in considerable change in the theory and practice of measuring personality.

Such inventories, however, reveal a number of important differences between sexes in answer to various questions. In a forthcoming study, data revealing sex differences in answering the Personal History Record will be presented. The importance of such differences may be of value in the development of standardized tests or schedules.

## SUMMARY AND CONCLUSIONS

1. The Ohio Wesleyan Personal History Record is an instrument which may be used as a basis for personality study from a clinical point of view. Its value for individual diagnosis from a statistical point of view is doubtful.

2. Correlations between Forms I and II indicate that there is a considerable amount of overlapping.

3. Scores on personality inventories and on the Personal History Record show no substantial correlation with either scholarship or intelligence.

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## L'HISTOIRE PERSONNELLE, L'INTELLIGENCE, ET LE RENDEMENT SCOLAIRE

## (Résumé)

Les notations de l'histoire personnelle présentées ici contiennent 169 parties choisies de divers Inventaires psychonévrosiques et questionnaires psychiatriques. Quatre-vingt-dix-neuf parties (Forme I) ont été employées comme échelle graphique d'évaluation, les autres (Forme II) exigeaient la réponse Oui ou Non. Alors on a corrélé l'un avec l'autre les résultats sur chacune des notations, les notations du rendement du premier

semestre, celui du second semestre, et celles des tests d'intelligence. On a computed les mêmes séries de corrélations pour les hommes et les femmes. Les coefficients de corrélation des variables étudiés ne montrent aucunes différences importantes entre les sexes comme groupes. Il existe cependant des différences individuelles importantes. Ces différences individuelles ont été d'une grande valeur pour l'emploi clinique puisqu'elles ont fait découvrir vite les facteurs généraux et spécifiques d'une mauvaise adaptation par celui qui s'en sert. Les corrélations entre les notations du rendement scolaire et celles de l'histoire personnelle ont été presque nulles. Le même résultat s'est montré quand on a corrélé les notations personnelles avec celles des tests d'intelligence. Ce manque d'une relation signifiante entre les notations de l'histoire personnelle et celles du rendement scolaire et de l'intelligence indique qu'un autre groupe de traits ou de qualités est mesuré par celles-là lesquels ne sont pas mesurés par nos instruments ordinaires de mesure. On trouvera dans des articles qui viendront d'autres faits et données où il s'agit de quelques aspects différents des notations.

THOMPSON

# BERICHTE ÜBER PERSÖNLICHE GEFÜHLSREAKTIONEN, INTELLIGENZ UND AKADEMISCHE ZEUGNISSE

(Referat)

Die hier unterbreiteten Berichte über persönliche Gefühlsreaktionen enthalten 169 Einzelheiten, die aus verschiedenen psychoneurotischen Inventaren und psychiatrischen Fragebogen ausgewählt wurden. Neunundneunzig Einzelheiten (Liste I) wurden als graphischer Maszstab verwandt; die übrigen (Liste II) waren entweder mit "Ja" oder "Nein" zu beantworten. Die Ergebnisse eines jeden Berichtes wurden dann mit einander korreliert ( $r$ ), nämlich die Zeugnisse des ersten Semesters, des zweiten Semesters und das Masz der Intelligenz (Intelligence test records). Dieselben Korrelationen wurden bei Studenten und bei Studentinnen ausgerechnet. Die Koeffizienten der Korrelation der untersuchten Variablen ergeben keine wichtigen Unterschiede zwischen den beiden Geschlechtern als solchen. Es finden sich jedoch wichtige individuelle Unterschiede. Diese haben sich für klinischen Gebrauch sehr wertvoll erwiesen, da sie es dem Kliniker ermöglichten, allgemeine und spezifische Faktoren schlechter Anpassungsfähigkeit (maladjustment) rasch zu konstatieren. Die Korrelationen zwischen Zeugnissen und den Berichten über persönliche Gefühlsreaktionen waren beinahe Null. Auch die Korrelationen zwischen dem Masz der Intelligenz und den Berichten über persönliche Gefühlsreaktionen waren fast Null. Dasselbe erfolgt, wenn die Berichte über persönliche Gefühlsreaktionen mit der Intelligenz korreliert werden. Dieser Mangel an bedeutsamer Korrelation zwischen den Berichten über persönliche Gefühlsreaktionen, Zeugnissen und Intelligenz weist darauf hin, dass eine andere Klasse von Eigenschaften oder Charakterzügen dadurch gemessen wird, die nicht durch unsere gebräuchlichen Maszstäbe gemessen wird. Weitere Ergebnisse und Tatsachen, die noch andere Gesichtspunkte der Berichte behandeln, sollen später veröffentlicht werden.

THOMPSON

# SHORT ARTICLES AND NOTES

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## GHOSTS OF THE SOPHISTICATED

RAYMOND ROYCE WILLOUGHBY

In so far as any interest at all is vouchsafed to the more spectacular phenomena of the human mind—such as apparitions—by its more orthodox students, opinion seems sharply dichotomized into what may be called (1) the naïve hypothesis, viz., that these phenomena may be accepted at approximately face value, and (2) the pseudo-sophisticated hypothesis, viz., that they consist entirely of fraud or morbidity. To be sure, the latter conclusion is difficult to avoid entirely, since it depends upon a definition which may be made sufficiently ample to support any conclusion. In keeping with a conviction, however, that such terms as “morbid” and “abnormal” are without any very precise or useful meaning, it has been suggested occasionally that phenomena so described are best observed as unusually dramatic forms of emotional occurrences which in more accustomed guise are experienced by all human beings. Thus under the first hypothesis mentioned above, apparitions should not occur in persons sophisticated enough to deny them objective validity; under the second, they should not occur in honest and reasonably “normal” persons. It is the purpose of the present note to report first-hand observations of apparitions in mature, honest, “normal” persons of a high degree of sophistication who were well aware that their experiences were purely subjective; and thus to support the alternative hypothesis mentioned, viz., that the phenomena are dramatic visual presentations of emotional phenomena which are ordinarily more implicit—waking dreams, so to speak.

The subjects, three in number, ranged in age, at the time of the experience, from 29 to 42; one was a male and two were females; all had college degrees, were above the 95th percentile in intelligence, held responsible positions and discharged well their duties in them, and were professionally concerned with psychological phenomena. All had been subjected to prolonged psychotherapeutic procedures, for reasons of both professional preparation and relatively mild states of emotional maladjustment; two were undergoing these procedures at the time of the experience considered; all were accordingly rather well sensitized to the occurrence of subjective phenomena which ordinarily never emerge into consciousness or pass unnoticed, and in the two cases mentioned the actual psychotherapeutic situation is to be regarded as highly favorable to the emergence and detection of such phenomena. These last considerations may be compared with the typical circumstances reported in the “naïve” literature, e.g., the subject



is already in a disturbed emotional state and passes a quiet graveyard alone, or a group of subjects, usually in a state of emotional tension, sit around a table in the dark and undertake seriously to observe their subjective experiences.

The first experience began as a terror dream; the dreamer was menaced by the typical ghost figure, indefinite and in white, but not noticeably transparent; the size was not far from that of a human figure, but rather more slender; the terror arose, in the usual manner, from the conviction that the intentions of the figure were physically hostile, and that its powers for damage included many totally outside the understanding of the dreamer and against which he was therefore helpless. He was awakened by the overwhelming affect; but after orienting himself in his surroundings, recognizing the experience as a dream, and endeavoring to regain composure, he was again terrified to observe that the figure was still present. It now took up a position directly to his rear and just out of reach.<sup>1</sup>

The menacing was continued and intensified; the figure now shook its fist in the direction of the subject, and (the idea of "catharsis" having occurred to the latter) "said": "If you tell about it, I'll kill you."<sup>2</sup>

The "voice" of the apparition was like the presumable "voices" of schizophrenic patients; i.e., it had no pitch or other phonetic qualities, and was very probably simply an intensified idea or pseudo-hallucination. Thereupon the subject woke up a person sleeping in the same room and communicated the entire experience—while the "ghost," still shaking its fist, diminished in size to a point, and vanished as the narrative was concluded. The "explanation" of the experience along Freudian lines was not difficult, granted the Freudian principles of "unconscious logic" which are invoked to connect such experiences causally with their underlying associations; but it need not be introduced here, as the purpose of this presentation is descriptive only.

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<sup>1</sup>Thus avoiding his objective line of vision, contact with which would presumably not be conducive, in a sophisticated person, with its continuance—i.e., a vision of this sort probably could not persist while it was being objectively looked at, unless in a person convinced beforehand that such figures had objective existence; this is a very interesting circumstance, and points to a motive to maintain the experience, and thus to Green's (2) specific defence of the Freudian contention that the wish-fulfillment motive is not absent even in terror-dreams; cf. also Erickson's (1) subject who could apprehend a repressed object in a crystal *provided* it was wrapped in paper or that her own figure in the crystal occluded her line of vision.

<sup>2</sup>Also an obscure but highly interesting circumstance, since—as we must assume that the "instance" or motive operating the figure was in communication with that set in the direction of exorcising it—"it must have known" that this challenge would fix the determination to tell.



The second apparition was encountered in the course of a psychotherapeutic session. Transference had been established, and was in the positive phase; accordingly, the prevailing material largely concerned the heterosexual parent, the early yearnings for affection from him, and their incomplete gratification. After a short period of silence in which the subject was quietly watching the internal play of imagery preparatory to reporting it, she became conscious of a luminous point in the distance, which approached, became larger, and took on the lineaments of the parent in question, though still somewhat small and remote. At a still considerable distance the figure stopped and beckoned; at this point the therapist, conceiving that it might be possible to effect important rapprochements between isolated "instances" by manipulating such phantasms, instructed the subject to allow the figure to approach nearer; but the resulting report was that it refused to do so, apparently demanding that the subject approach it instead (a repression device like the position of the apparition mentioned above and Erickson's "occlusive" subject, since of course the conflict between attempting to go anywhere and being fully conscious of lying relaxed upon a couch would be too great a strain upon the illusion). The therapist then deemed it expedient to make concessions to the repressive "instance," and offered to withdraw, an affirmative answer to which was duly relayed back via the subject "from the figure." During the therapist's brief absence from the room the figure did indeed approach, but probably owing to the novelty of the situation for the subject "it seemed to be suspicious."<sup>8</sup>

Due to the "suspicion" of the ghost in question, it was necessary for the entire series of phenomena to be initiated again; it ran practically the same course, except that this time suggestions were given to the effect that the figure should be granted whatever it desired (i.e., that the wish it represented should attain some sort of gratification). Under these conditions of reassurance, a sort of mystical union was reported, which, accord-

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<sup>8</sup>It is a matter of considerable interest that from the viewpoint of internally consistent description of such phenomena there is little to choose between a cold technical description in terms of intra-psychic conflicting motives, repressed tendencies, etc., and a grossly anthropomorphic vocabulary treating the apparition as if it were indeed a discarnate personality; as a matter of fact, in manipulating these phenomena for therapeutic purposes, the therapist here concerned has found it most simple and effective to use the latter terminology, only checking it over rapidly in advance of utterance to see that there are no important failures of parallelism between it and the more accurate form; thus, in response to the report "He [the ghost] lays his head in my lap" it is clearer and more effective to suggest that "He seems to want to feel that you're his friend" rather than the more pedantic but more accurate form "There seems to be a motive in you which wishes to be reconciled to the motives symbolized by the ghost."

ing to the usual clinical criteria of non-reappearance, etc., seemed to be effective in "laying the ghost" and a large part of the "Oedipus conflict" with it.

The third encounter also took place during a psychotherapeutic session, and in fact spread over several such sessions. The subject, although consciously as sophisticated as the others mentioned, had evolved a system of private "superstitions"—entirely out of accord with her rather matter-of-fact training—which appeared to have the advantage of giving her some reassurance in the face of a universe apprehended as hostile, but the disadvantage of giving a feeling of unreality to daily experiences and a certain sense of inferiority as compared with her companions, who were of course not "superstitious." She was therefore rather favorable terrain for the sort of phenomena under discussion.

A prominent feature of the deeper material reported by this subject was the loss of an older brother in adolescence; upon this brother converged a number of important emotional trends, and his death, although it had been beaten into official affective neutrality, had never been adequately assimilated.<sup>4</sup>

After a fairly desultory half-hour of discussions of mood, daily events, and some memories of the brother, the subject suddenly volunteered after a short silence that although her work had for a number of years taken her into lonely and dangerous places at night without eliciting any timidity, she felt that she was going to be afraid to go home this particular evening; further associations showed that there was felt to be in the external dark some kind of menacing and powerful personality, intelligent but not precisely human. These associations were accompanied with increasing anxiety, and the psychotherapist's suggestion that in view of certain preceding remarks this personality suggested the brother precipitated this in the form of weeping and protests. Regarding this as satisfactory fulfilment of the affective criterion, the therapist now directed the subject (1) to describe the apparition, to which the response, given in tones and with behavior indicating terror, was that he was "everywhere—over everything—as big as the world"; and (2) to "ask" him what he wanted. The latter instruction was met by a scream and renewed sobbing, but by continued firmness the subject was brought to initiate the necessary processes (the nature of which would be a matter for interesting specula-

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<sup>4</sup>It is a matter of some interest that all three of the "ghosts" here reported were representations of persons actually dead; this is of course parallel to the culture patterns, but it is not entirely clear why the latter should state the matter in this form, and so state it over so wide an area of otherwise unrelated cultures. There seems to be no *a priori* reason why such apparitions should not include the living, but as a matter of fact death seems the universal prerequisite for reversion.

tion). The answer eventually came back, "He says 'Nothing,' and gives a short laugh and turns away." Further insistence on parleys with the "specter" resulted presently in its separation into two figures (without suggestion on the part of the therapist): a fairly normal figure of the brother, pleasant and friendly, as at the time of his death, and the original menacing world-shadow, suggesting to the therapist the sinister figure of Astarte stretching over the heavens in the background of Sargent's mural on the conflict of Judaism with the primitive Canaanite religions. Nothing further could be elicited; this subject is incapable of intensive work "under fire" for any considerable period, and this fact must be accepted as a limitation upon the rapidity of investigational and therapeutic progress; it is as if the psychic organization were incapable of submitting to more than a given degree of insult at a given time, and when this had been reached some metaphorical "governor" or safety valve initiated the return of the insulting forces to the relative safety of repression.

Due to this limitation no definite "understanding" has been reached with this "ghost" at the time of writing. He has reappeared in one form or another several times, but usually with relatively diminished affect; an interpretation has been offered for "his" motives—i.e., for those motives of the subject represented by the figure—but its acceptance has been without conspicuous affect, thus leaving its accuracy in some doubt. However, on a recent occasion a pure affect, without discernible trace of ideational content, of sheer panic accompanied by sensations of numbness in specific areas, burst suddenly through a defensive screen (so recognized spontaneously by the subject) of "manufactured" conversation about items and annoyances of daily life; the numbness was associated (on the neutral suggestion of the therapist that surely such a clear-cut occurrence must have *some* associations) with rigor mortis, and it appears reasonable that we have to deal with the same figure deprived of its ideational aspects by the preceding interpretations. In the meantime the general clinical appearance of the subject's adjustments and personality has seemed definitely improved, and it is anticipated with some confidence that any success in enabling the subject to achieve full emotional interaction with the figure, either by repeated contacts of low affective tone or by one or two cataclysmic experiences, should result in the assimilation of the "ghost" motives into the balance of the personality and so effect the banishment of the ghost to the psychic museum.

It does not require extraordinary imagination to perceive that such observations are remarkably rich in significance, that is, in bearings upon a number of related psychic phenomena of a traditionally puzzling nature. Ghost No. 1 will immediately suggest malicious gnomes and elves, and the "little people" of whom one may not speak (i.e., their continued existence

is dependent upon not speaking of them to any extent, and since they serve to gratify important but unrecognized wishes they will themselves furnish threats against any procedure which threatens their existence). The universality of these figures is worth mentioning, since there is a widespread but uncritical belief that such phenomena are to be "explained" simply as products of cultural transmission; they are met, for instance, in Ireland as "the little people," in Ashanti as *mmoatia*, and among the Penobscots as *mikomwesiu*; we leave to the statistician the calculation of the probability that these derive from a common source. Ghost No. 3 will suggest another class of folk lore figures, exemplified by the trolls of Norway, Jack the Giant Killer, and the dark mother goddess of the East, Astarte. Ghost No. 2 is not so clear, but may bring to mind certain ancestor propitiations and totemistic ceremonies.

Another aspect of the significance of such phenomena is in connection with states of dissociation, as seen in amnesia, hypnosis, and multiple personality. These conditions are marked by the apparent isolation of motives or segments of the total conative forces, which frequently can be shown to be unacceptable to the remainder of the psychic organization. This is similar to the condition prevailing with the ghosts, which differ, however, in representing not a phase of the subject's direct conations, but a sort of projected counterstructure (a "straw man" in the proverbial sense) made ideationally necessary by such a phase. Thus Ghost No. 2 is not an aspect of the subject's desires, but a result of a sort of filling out of a total structure in which the subject is desiring her father's love and cannot secure it except by supplying a father to give it. This may be the answer to the question previously posed as to why ghosts are uniformly representations of the dead.

Finally, the bearing of such observations upon two opposed and perhaps equally pseudo-scientific viewpoints may be stressed. The viewpoints are those of so-called psychic research and "anti-superstition" movements. In so far as the former is not an outright fraud, it appears to be very largely weighted with the product of the interaction of ghost-producing "instances" in (1) naïve subjects, and (2) naïve observers; the important observation has not yet been made by these individuals that such phenomena may be sympathetically and fruitfully studied without losing sight of the fact that they are still subjective phenomena. The opposed point of view appears to regard incredulity as a virtue *per se*, and it is in consequence under some suspicion of being a reaction-formation from the ultra-naïve, somewhat as the religious convert is impregnable in his faith and the most jealous champions of "culture" are those who never had any. It is popularly manifested in the ridicule and contempt with which accounts of magic practices, etc., are received, and in the self-consciousness with which most individuals are



accustomed to confess (when they do) any lapse from the conventional "hard-boiled" attitude; and "scientifically" in reports, largely by educational psychologists, of "drives" against "superstition" in this or that high school or college, usually through the medium of the science curriculum. The work of the latter has the complication, ordinarily, that the term "superstition" is applied to instances of mere lack of information, a practice which inevitably introduces gratuitous misconceptions; thus subscription to the belief "Fish is a brain food" is in no useful sense an indication of "superstition," and by the same token the disappearance of such a belief under the inculcation of more adequate information by no means warrants any generalization as to the efficacy of science teaching in abolishing "superstition." To suppose that an item of real superstition (i.e., in the most common case, magic) such as "knocking on wood averts bad luck" disappears under ordinary conscious-level instruction, is extremely naïve, and argues a condition of psychological density on the part of the supposer so extreme that he cannot appreciate that children will give that reply which has been observed to bring the greatest approbation. Such experiences as those reported above amply indicate that full official training as well as intellectual conviction of the subjectivity of the phenomena are no necessary bar to their occurrence.

"Culturalistic," "naturalistic," and "habit" explanations for these phenomena appear for the most part to be based more or less directly upon the "anti-superstitionist" viewpoint. There is no reason to dispute that the forms current in a society modify somewhat both the incidence and the forms of subjective occurrences of this variety, or that the naïve mind is prone to seize upon naturalistic events to justify and confirm its beliefs; thus "dragon" (dinosaur) bones are sold by Chinese apothecaries, and it is reasonable to ascribe some of the "dragonistic" coloring of this folklore to the presence of these fauna in the environment. Likewise the habit of knocking on wood, like that of blowing the nose, may become so firmly established by early training that it needs no other explanation for its survival over a generation or two. But such explanations, if too widely generalized, have the fatal defect that they fail to provide any account of the mechanisms by which the practices and subjective states are accepted and fixed with such special affective force, and even (as in the present instances) elaborated without ascertainable etiology of the sort required by the hypothesis. The facts appear to require rather some hypothesis involving need, tension, motive, or similar dynamic inequality, which if it becomes sufficiently intense may break through to a state of comparative equilibrium which has no direct relationship to external reality but is nevertheless highly adaptive as a resolution of a condition of internal distress. Thus we arrive from the psychic side at something much re-



sembling those theories characterized by Lashley with comic effect as "psychohydraulics," but which notwithstanding appear to be taking on a semblance of independent probability with the development of the Pavlovian concepts of excitation, inhibition, and irradiation.

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THE EFFECT OF MOOD ON PERSONALITY TRAITS AS  
MEASURED BY BERNREUTER

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The layman is as distrustful of the current attempts to measure personality traits as he was twenty years ago of the attempts to measure intelligence, and there are psychologists who are inclined to share his skepticism. One ground for this distrust is the fact that inspection of the numerous questions put to the subject by the typical personality test easily gives one the impression that the answers given by a subject to many of the questions would probably be seriously affected by moderate changes in affective tone. On the other hand, the authors of such tests appear to assume that the personality of an individual is fundamentally a constant, which can be measured with reasonable accuracy despite superficial influences of passing moods. The general use they have made of the split-half method of computing the reliabilities of their measures clearly indicates this assumption even when it has not been specifically set forth. Otherwise, presumably, the test-retest method would have been more generally employed.

The assumption may or may not be correct. Certainly in the case of intelligence tests it was only after the accumulation of a vast amount of retest data that psychologists became convinced of the relatively small influence on intelligence scores of such ephemeral factors as fatigue, physical illness, loss of sleep, etc. In the case of personality tests there is even more ground for reasonable suspicion on this point, since they are composed largely of questions which call for expressions of attitudes, likes, dislikes, and interests, all of which are commonly believed to vary greatly from day to day. Even those questions which call for factual information as to how the subject has been accustomed to feel or behave under such

and such circumstances in the past might conceivably be greatly influenced by the mood of the subject at the time the test was taken. Whatever the facts may turn out to be, it is hardly defensible to proceed on the unsupported assumption that in the testing of personality traits day-to-day changes in affective tone can safely be ignored.

This study is offered as a very minor contribution on the problem just stated. The number of subjects with which it deals is much too small to warrant the drawing of any conclusions with regard to the question raised, but as the writer is at present unable to remedy this deficiency it may be worth while to make a brief report of the study for whatever suggestive value it may have to other workers.

The primary purpose was to investigate the influence of mood on the four measures yielded by the Bernreuter Personality Inventory: neurotic tendency, self-sufficiency, introversion, and dominance. It was expected that in case any statistically reliable changes were found they would probably show a depressed mood to increase the scores for neurotic tendency and introversion and to decrease those for self-sufficiency and dominance. The subjects were 15 graduate and undergraduate women at Stanford University. The plan was to have each subject take the Bernreuter test twice, once when in a depressed mood and once when in a mood decidedly above normal.

The difficulties in the way of securing valid data of the kind sought are obvious. Apart from the fact that no dependable objective measure of affective tone has been devised, there is the problem of ruling out the possible influence of suggestion upon the answers given by the subject to the Bernreuter questions. The first of these difficulties is perhaps the less serious. Mood is after all a highly subjective phenomenon and for this reason is probably capable of being much more accurately rated by introspection than almost any other psychological state. The subject was therefore given a five-point scale for rating mood and was asked to take the test at whatever time she found herself to be in particularly high or low spirits.

A mild deception was resorted to in order to counteract the effect of suggestion which the self-rating of mood would be likely to arouse. A word association test was used which purported to be the body of the mood study. This consisted of a list of 100 words to each of which the subject responded with "pleasant" or "unpleasant." The choice of stimulus words for this association test was based on the introspective judgment of the writer, who hoped that it would later be possible to select from them, on the basis of the test results, a valid list which would be usable in the differentiation of moods. The point to be noted here is that the association test blank was in two sections of 50 words each, and that the

Bernreuter blank was filled out between the two sections with the understanding that it had nothing to do with the mood study. In order to make this procedure more plausible the subjects were told that a rest-break was needed between the two parts of the association test and that the time necessary for that purpose was being utilized to gather additional data desired by the department on another problem.

No pressure was placed on the subjects with respect to time at which the test was to be taken. She was simply told that if she found herself to be unusually depressed or unusually gay and cheerful to fill out the blank, otherwise she need not bother. About two weeks after the first mood measure had been turned in the subject was provided with a second set of blanks and requested to fill them out whenever she found herself in the opposite mood from that under which the first test was taken. The subject was never hurried and was in fact cautioned earnestly against taking the test unless she found herself in a definitely subnormal or super-normal mood.

In the case of 9 subjects the test was taken first in a depressed mood, by 6 in an elated mood. The order, however, is probably not significant, as our interest is in the amount of change.

TABLE 1

	$D_{means}^*$	$\sigma_{diff.}^\dagger$	$\frac{D_{means}}{\sigma_{diff.}}$	Critical ratio
B1-N	.11	.15	.11/.15	.7
B2-S	-.08	.15	-.08/.15	-.5
B3-I	.17	.15	.17/.15	1.1
B4-D	-.27	.12	-.27/.12	-2.3

\*Difference between *means* expressed as standard scores, i. e.  $D_{M1-M2}$ ,  
 $\sigma_{dist.}$

where  $M_1$  = depressed, and  $M_2$  = elated.

†Standard error of difference between *means* in terms of standard scores, i. e.

$$\sqrt{\frac{2-2r_{11}}{N}}$$

## RESULTS

As will be seen in Table 1, the differences between the means for the two sets of Bernreuter scores are not large, but they are in the expected direction, suggesting that a depressed mood is accompanied by increase of score for neurotic tendency and introversion, and by a lowering of

score for self sufficiency and dominance. In the case of dominance the difference approaches statistical significance.

We may turn next to the results of the association test, which the subjects had been led to regard as the main part of the experiment. As previously explained, this consisted of 100 words, to each of which the subject was asked to respond with "pleasant" or "unpleasant." It was assumed that in a period of depression the number of "unpleasant" responses would be greater than when the subject felt elated. This was found to be the case for 11 of the 15 subjects, but there were four for whom the results were reversed. There is no way of knowing whether these reversals are genuine or whether the four subjects in question had not cooperated in selecting

TABLE 2

	B1-N	B2-S	B3-I	B4-D
Mean change (i.e., $D_{M_1-M_2}$ )*	17.67	-5.53	11.93	-16.20
$\sigma_{dist.}$ (Bernreuter's values, Table 36, p. 89) (2)	78.9	55.7	46.5	63.5
Difference between means in terms of standard scores, i.e. $\frac{D_{M_1-M_2}}{\sigma_{dist.}}$	.22	-.09	.25	-.25
$\sigma_{diff.}$ in terms of standard scores i.e. $\sqrt{\frac{2-2r_{11}}{N}}$	.14	.14	.15	.12
$r_{11}$ (Bernreuter, Table 36, p. 89) (2)	.84	.84	.83	.89
Critical ratio, i.e. $\frac{D_{M_1-M_2}}{\sigma_{diff.}}$	1.54	-.68	1.70	-2.11

Note: With so small a population, chance factors may unduly affect the determinations of measures of dispersion and reliability, necessary to evaluate the statistical significance of changes. Since a more accurate estimate of these values for a sample of college women is available in Bernreuter's (2) figures based on 317 college females, it was thought best to assume these values for  $\sigma_{dist.}$  and  $r_{11}$  in computing the  $\sigma_{diff.}$ 's.

\* $M_1$  = depressed;  $M_2$  = elated.

periods of elation and depression for taking the tests. For the entire group of 15 subjects the "mood change" scores yielded by the association test (self-ratings for elation and depression disregarded) correlated as follows with degree of change in Bernreuter scores:

	Rho
B1-N	.39
B2-S	.20
B3-I	.43
B4-D	.19

Table 2 shows the amount and significance of average change in Bernreuter scores when the mood at the time a test was taken is classified according to the results of the association test instead of according to self-rating.

A number of individual subjects showed large changes in Bernreuter scores, several of the changes ranging from 2.5 to 4 times the magnitude expected from chance. Bernreuter (2) gives the following values as the probable errors (erroneously called standard errors in his published report) of raw scores:

B1-N	= 30.4
B2-S	= 20.9
B3-I	= 18.1
B4-D	= 19.8

The following are instances of changes found:

	N	S	I	D
Subject A	84	—	57	85
Subject B	—	—	—	76
Subject C	75	—	45	56

Reversals opposite to the hypothetical direction occur rather frequently for individual scores, but the largest of these are only approximately equal to their probable errors as given above.

In considering the changes in Bernreuter scores from high to low mood, it should be noted that the true extent of these changes has probably been minimized if there exists any considerable correlation between errors in the two testings. For if the answering of items once in a given manner tends to "fix" subsequent answers, then the score during a "low" mood will be affected not only by the current mood but by the memory of answers previously made when in a "high" mood. It is clear that the "fixing" effect of this last factor would tend to mask changes in score that might result from changes in mood. That this effect is not a negligible one is suggested by a comparison of Tables 3 and 4. Table 3 gives the reliability coefficients as estimated by correlating (by the rank-difference method) the scores for high mood with those for low (as determined by self-ratings). Table 4 gives the reliabilities as estimated by stepping up the odd-even



TABLE 3  
TEST-RETESTS: (1) *vs.* (2)

Scale	Rho
B1-N	.91
B2-S	.90
B3-I	.90
B4-D	.84

TABLE 4  
ODDS *vs.* EVENS ON HIGH-MOOD TEST

Scale	Rho	$r_{11}$
B1-N	.72	.84
B2-S	.45	.62
B3-I	.72	.84
B4-D	.72	.84

correlations (rank difference) for the high-mood test. Since self-rated mood was imperfectly controlled, we should expect, if the memory factor were negligible, that the reliabilities in Table 3 would be *lower* than in Table 4. But since the reverse is the case, it is apparent that the "fixing" of responses tends to conceal score-changes which shifts in mood would otherwise bring about.

If the extent of correlation due to the memory factor were known, a correction for it could be made in evaluating statistically the observed changes. Such a correction would increase the observed differences and correspondingly increase the critical ratios. However, the present data do not afford a basis for measuring the desired correlation. For this purpose we would need two comparable forms of the Bernreuter. Lacking two forms, the next best procedure would be to use the odd items as Form 1, the even as Form 2. It should be noted that the stepped-up reliability so obtained (with mood allowed to vary randomly) would be a more valid method than the split-half technique for establishing the reliabilities of the Bernreuter scales. If random shifts in mood are capable of occasioning marked fluctuations in score, they should be taken into account, as otherwise the reliability determinations are spuriously high.

We may next ask whether "mood change" scores are related to any of the four Bernreuter scores. Is variability, for example, characteristic of the neurotic or introverted personality? The data of the present study give no support to this theory. The five subjects whose mood scores changed most tested relatively low in neurotic tendency. Of course, in such a small population the classification as "moodiest" would be largely a matter of chance, depending on when the subjects happened to take the test.

Item-by-item tabulations were made of the response changes made by each subject in both the Bernreuter and the association test. Marked differences in this respect were found among the items of both tests. In the Bernreuter test a total of 204 response changes were made or an average of 1.6 on the 125 items. Items yielding four or more reversals include Nos. 9, 17, 42, 50, 64, 84, 108, and 123. Items showing no reversals and therefore more stable under mood changes are: 7, 12, 13, 14, 19, 26, 34, 37, 38, 51, 54, 60, 70, 74, 76, 92, 93, 112, and 120. Examination of these items suggests that one factor determining stability of an item is the extent to which the response approximates a memory report of past experiences or behavior.

For the purpose of determining which words in the association test tended to change their affective connotation with change in mood the subjects whose self-ratings disagreed with the direction of their total association scores were omitted. The item analysis is based on 13 subjects. When a reversal for one subject did not agree in direction with the trend for other subjects it was considered that it was at least possibly due to chance (the result of colorlessness of the word); cancellation was therefore employed and those words here presented as diagnostic of mood for this group are those having a score of *five or more* reversals after the cancellation of opposing reversals. The average number of reversals found per word without regard to direction is 3.08.

Words most affected by change in mood as measured:

house	popularity	energetic	long
black	rug	society	brisk
time	ice	flirtation	early
pep	ambition	light	try
wake	arouse	excitement	talk
man	surf	climb	

Words least affected:

ocean	pocketbook	rain
white	dashing	book
exert	lecture	change
leap		

#### DISCUSSION

The chief weakness in methodology of the present study, aside from the small numbers involved, is the validity of self-rating as a criterion of mood. If mood be thought of in terms of generalized affective tone the most desirable criterion would probably be an association test of rather wide scope and chosen on a basis of sensitivity to mood changes. Unfortunately such a tool is not yet available. Such an attempt as Jasper's (4) "Depression-Elation" questionnaire, including as it does such material as opinions on the progress and strength of the church today as indicative of mood, seems of doubtful validity for university groups.

In the absence of an objective tool, ratings are the only alternative. Rating by others, such as mothers or associates, has the advantage of more nearly controlling the suggestion factor. However, for a highly socialized group, inhibition of expression would greatly hinder associate-ratings of mood. It is doubtful whether we really have a very great spread of mood in anything like all of our cases. Washburn's (5) studies on mood and temperament suggest that the magnitude and frequency of mood change is in itself a personality trait that offers a promising field for investigation. However, that is beside the point for the present purpose. It should be defensible to make a definite change of mood a requirement when it is mood change *per se* which is the subject of the study. If to that end the double criterion of the self-rating plus expected direction in the association score were accepted as requisite to inclusion in the data, a study of the type with which we are here concerned would doubtless yield more positive results.

As has been pointed out, memory of the responses made at the first taking of the test is probably a powerful variable operating throughout these data to an unascertainable extent and in the direction of nullifying the expected findings. Accordingly, the differences between moods found may be thought of as more indicative of a real trend than would be the case if this factor were not operating to hide them. As has been suggested, this variable could be controlled by presenting the tests as two halves at different sittings. The reduced reliabilities could be compensated for by the use of large populations.

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## THE INSTABILITY OF POST-WAR MARRIAGES

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## INTRODUCTION

The purpose of this paper is to point out the effects of a major social upheaval, the World War, upon a social institution, marriage. It will be demonstrated that the abnormally large number of marriages contracted immediately following the World War led subsequently to a greater number of divorces than might be expected from comparison with the divorce rates for other years. Several explanations for this phenomenon will be considered.

## ANALYSIS OF CENSUS DATA

The Federal Government has taken an annual census of marriage and divorce since 1922. Before 1922 marriage and divorce statistics were collected for the single year, 1916, and for the period from 1867 to 1906.<sup>1</sup>

In glancing over the marriage and divorce census for 1930 the writer noted a very interesting phenomenon in Table 22 of that publication. Table 22 gives the divorces classified according to the number of years married. For example, in 1922 there was a total of 141,110 divorces granted. Of these, 6,445 involved couples who had been married for less than one year, 12,126 involved couples who had been married for one year up to two years, 14,220 involved couples married from two years up to three years and so on. In the second part of this table the percentage distribution of divorces for the various years' duration of marriage is recorded. That is, the 6,445 divorces granted in 1922 to couples who had been married less than one year were 4.6% of the total number of divorces granted in 1922, the 12,126 divorces granted to couples who had been married for at least one year and less than two years were 8.6% of the total, and so on.

By consulting the second half of Table 22, which has been revised and reproduced here as Table 1, it will be noted that the percentages of total divorces for any given category of number of years married (that is, the values making up any given row) are quite constant with two marked exceptions in each row. For two years' duration of marriage, the percentage of total divorces for any one year is largest for the years 1922 and 1923, for three years' duration of marriage the percentage of total divorces is greatest for the years 1923 and 1924, and so on. These extreme deviations

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<sup>1</sup>See the following publications of the Bureau of the Census. A Report on Marriage and Divorce in the United States: 1867 to 1886, Marriage and Divorce: 1887 to 1906, Marriage and Divorce: 1916, and Marriage and Divorce: 1922 to 1931.

TABLE 1  
DIVORCES CLASSIFIED ACCORDING TO DURATION OF MARRIAGES, 1922-1931\*

No. of years married	1931	1930	1929	1928	Percentage distribution					1923	1922
					1927	1926	1925	1924			
Less than 1 year	4.2	4.4	4.4	4.5	4.6	4.7	4.7	4.6	4.5	4.6	4.6
1 year	7.6	7.8	7.5	7.8	7.9	7.9	8.2	7.7	7.4	8.6	8.6
2 years	8.4	8.3	8.5	8.6	8.7	8.9	8.6	8.1	9.4	10.1	10.1
3 years	8.3	8.5	8.7	8.5	8.7	8.7	8.2	9.2	10.1	8.7	8.7
4 years	7.8	7.9	7.8	8.1	7.9	7.6	8.5	9.3	8.0	7.9	7.9
5 years	7.0	7.2	7.4	7.3	6.9	7.8	8.3	7.1	7.2	6.8	6.8
6 years	6.4	6.4	6.3	6.1	7.0	7.4	6.2	6.4	6.3	5.7	5.7
7 years	5.8	5.6	5.5	6.1	6.5	5.5	5.6	5.5	5.1	4.9	4.9
8 years	4.9	4.8	5.4	5.8	4.8	4.8	4.8	4.5	4.4	4.7	4.7
9 years	4.4	4.7	5.1	4.2	4.1	4.2	4.0	3.8	4.2	4.3	4.3
10 years	4.3	4.4	3.6	3.7	3.6	3.3	—	3.7	3.9	3.9	3.9
11 years	4.0	3.2	3.3	3.2	3.0	2.8	—	3.4	3.3	3.4	3.4

\*This table is a revision of Table 22, Page 33, Marriage and Divorce Census, 1930. The percentages for 1931 have been added, the figures after the ninth year of marriage have been computed for individual years in place of five-year intervals, and no divorces beyond the eleventh year have been considered. Hence, the percentages do not total 100.



are italicized. The reader will observe that they fall along two adjacent diagonals.

It should be evident that all divorces which fall along a diagonal in Table 1 involve marriages which occurred during some previous and fixed period of years. The dates of these periods can be easily determined. For if a divorce was granted sometime during the year 1922 to a couple who had been married for at least two years and not more than three years, the marriage must have occurred in either 1919 or 1920. Likewise if a divorce was granted sometime during the year 1923 to a couple who had been married for at least two and not more than three years, the marriage must have occurred in either 1920 or 1921. Hence, the discrepancies noted in Table 1 are due to an abnormally large number of divorces resulting from marriages which were contracted in the years 1919, 1920, and 1921.

It was stated in the introduction that an unusually large number of marriages occurred during the post-war years. In 1919, 1920, and 1921 the marriage rates per 1000 of the total population were 10.95, 11.96, and 10.76 respectively. These rates are three of the five largest recorded from 1887 to 1931. Therefore, the statistics which are presented in Table 1 must be corrected for the total number of marriages from which the divorces were drawn before any valid conclusion can be reached.

The following procedure was used in making this correction. A table was constructed to show the years during which the marriages ending in divorce took place. The number of divorces was divided by the number of marriages and the ratio multiplied by 1000 to give a divorce rate per 1000 marriages. These divorce rates appear in Table 2.

The figures in Table 2 should be interpreted in the following way: 3.4 of every 1000 marriages occurring in the years 1930-31 ended in divorce in 1931, or less than one year after they were contracted. In order to eliminate the trend of an increasing divorce rate up to 1929, the figures in Table 2 were converted into percentages. These percentages were obtained by dividing every rate in a column by the total rate for that column. The percentages appear in Table 3.

Table 3 contains the essential data for the argument. The figures appearing in each row are very constant except for the high percentage of divorce in 1922 for two years' duration of marriage, in 1923 for three years' duration of marriage, in 1924 for four years and so on down the diagonal to the eleventh year in 1931. This can only mean that those marriages which occurred in the post-war years, 1919 and 1920, have resulted in disproportionately more divorces than any other year for which figures are available. It will be observed that correction for number of marriages has eliminated one diagonal of discrepancies. The percentages



TABLE 3  
PERCENTAGE DISTRIBUTION OF DIVORCE RATE PER 1000 MARRIAGES ACCORDING TO DURATION  
OF MARRIAGE: 1922-1931\*

No. of years married	Year of divorce										
	1931	1930	1929	1928	1927	1926	1925	1924	1923	1922	
Less than 1 year	6.3	6.1	5.9	5.9	6.0	6.2	6.2	5.9	5.6	5.9	
1 year	10.4	10.4	10.1	10.3	10.4	10.3	10.5	10.0	9.7	10.4	
2 years	11.3	11.2	11.3	11.3	11.5	11.5	11.2	10.8	11.5	12.3	
3 years	11.2	11.4	11.6	11.3	11.3	11.4	11.0	11.6	12.5	11.9	
4 years	10.5	10.7	10.5	10.7	10.5	10.3	10.8	11.8	11.2	10.9	
5 years	9.5	9.8	9.8	9.8	9.5	10.0	10.5	10.1	10.0	9.1	
6 years	8.7	8.5	8.6	8.4	9.1	9.5	8.9	9.2	8.5	8.1	
7 years	7.8	7.7	7.7	7.9	8.5	8.0	8.0	7.5	7.3	7.2	
8 years	6.8	6.8	7.1	7.6	7.0	7.1	6.7	6.6	6.4	6.8	
9 years	6.2	6.3	6.7	6.2	6.1	5.9	5.9	5.8	6.2	6.3	
10 years	5.8	6.1	5.6	5.7	5.3	5.2	5.4	5.6	5.8	5.8	
11 years	5.5	5.0	5.1	4.7	4.7	4.5	4.9	5.1	5.0	5.2	

\*Since these percentages are based upon Table 2, which is curtailed at the eleventh year, they should not be interpreted as representing the complete distribution of percentages for the total number of years' duration of marriage. If the total number of years married had been used the percentages appearing in Table 3 would be lowered. This fact does not, however, invalidate the argument.

of divorces for the 1920-21 marriages are now consistent with those for other years.

#### DISCUSSION

In order to account for the greater number of divorces which resulted from the 1919 and 1920 marriages, at least four hypotheses must be considered.

The most plausible one is that the unstable post-war marriages were an effect of the war itself. The argument for this hypothesis can be developed as follows. During a war-time period and especially when there is more or less universal conscription among certain age ranges, many young men and women who would normally contract marriage are forced to delay this act. Such a delay period, spent in partial segregation between the sexes, serves to intensify the normal desire to participate in matrimony and this intensified desire has the effect of reducing even the customary rationality which men and women display when they agree to contract marriage. Furthermore, the hysteria attendant upon the close of a major conflict undoubtedly acts as another inhibitor of rational processes. There is also a third factor operating to make for unstable marriages as a result of war. Presumably many couples anticipating a delay agreed to and did marry as soon as the war was over. War is, however, a notable breeder of personality and physical changes and many of those engaged couples who had been compatible before the war were so changed, psychologically and physically, that there was no longer any compatibility. And yet because they felt bound by their previous betrothals they entered into an unsatisfactory connubial relationship. Thus heightened desire, post-war hysteria, and personality or physical changes, operating singly or together, can account for the instability of post-war marriages.

The second hypothesis is merely a more generalized statement of the first one and may be stated as follows. When any condition arises in the social life of a nation to delay the act of marriage, those marriages contracted immediately after the obstacles are removed will be less stable than marriages not so hindered. This hypothesis likewise rests upon the two factors of intensified desire and personality and physical changes engendered by the delay period. Aside from the World War there has been no other long delay period, falling within the range of years covered by the marriage and divorce census, which may be used to test this hypothesis. We are, however, going through a period at the present time which is forcing many couples who would normally marry to delay this act. This is evinced by the falling marriage rate since 1929. It will be interesting to see whether those marriages contracted after the depression is over are less stable than customary.

A third hypothesis would be that the instability of post-war marriages

is merely one example of the instability of an abnormally large number of marriages, and that any year where the rate is unusually large the resulting divorce rate will be correspondingly high. This is a less satisfying hypothesis than either of the first two because it does not state why a large marriage rate should yield a disproportionate number of divorces. Fortunately, this hypothesis can be readily checked in the following way.

The median percentage for each row in Table 3 was computed. The deviations from these medians were then figured for every value appearing in the table. It has already been stated that each diagonal running from upper right to lower left represents divorces yielded by marriages contracted during a fixed two-year period. Thus by adding the deviations for each diagonal and dividing by the number of values appearing in the diagonal, the average deviation from the medians of the several rows is obtained. If the average deviation is positive, it means that the divorce rate is higher than the average; if negative, the divorce rate is lower than the average.

The values obtained from such an analysis and the marriage rate for those years from which the divorces are drawn appear in Table 4. We

TABLE 4

Year of marriage	Average deviation from medians of rows	Marriage rate per 1000 population
1927-28	— .15	10.01
1926-27	— .04	10.24
1925-26	.03	10.33
1924-25	.02	10.41
1923-24	.01	10.75
1922-23	— .12	10.67
1921-22	— .26	10.54
1920-21	.19	11.36
1919-20	.77	11.45
1918-19	.22	10.30
1917-18	.19	10.43
1916-17	— .31	10.94
1915-16	— .37	10.41
1914-15	— .42	10.30
1913-14	— .04	10.53

have not included the average deviation for any diagonal which contained fewer than four values.

An inspection of this table indicates that a high marriage rate does not necessarily mean an abnormally high divorce rate. We have computed the rank-order correlation coefficient between the average deviations and the marriage rates. This value is  $.24 \pm .17$ , indicating a lack of relation-



ship between a disproportionately high divorce rate and a high marriage rate.

Table 4 displays, even more strikingly than the earlier analysis did, the relatively disproportionate number of divorces resulting from the 1919-20 marriages. The average deviation is .77, a value considerably higher than any other in the column.

Finally we must consider the possibility that neither the first nor second hypothesis reflects the reality. It is quite possible that some other condition specific to the years 1919-20 accounts for the instability of the marriages contracted during that period. We could conjure with the fact that those years were not only post-war but also marked the beginning of the prohibition of alcoholic beverages. I see, however, no logical connection between the beginning of prohibition and the instability of marriages performed at that time. Possibly the reader can, or perhaps he may suggest some other factor which I have ignored.

I prefer to think that either the first or second hypothesis adequately accounts for the facts presented in this paper. Either theory ties in with the viewpoint current in psychology and especially psychopathology, namely, that blockage of normal outlets for the needs and desires of man often has disastrous consequences.

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## BOOKS

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GLADYS C. SCHWESINGER. *Heredity and Environment: Studies in the Genesis of Psychological Characteristics*. New York; Macmillan, 1933. Pp. viii+484.

The problem of this book has long been the subject of dogmatic asseveration. Pronouncements upon it are made without any reference to scientific evidence, or if evidence is cited it is interpreted in a highly partial manner. This dogmatic treatment is characteristic of the discussion by scientific as well as by popular writers. Whole schools of thought are founded on the doctrine that heredity or environment is the predominant influence in determining human behavior. Academic disciplines are lined up on the one side or the other.

This way of dealing with the problem has more the flavor of scholastic dialectic than of the scientific approach. After all, the solution will be reached, if it is reached at all, by the accumulation of critically evaluated evidence rather than by argument. While the evidence is far from complete, it has been accumulating fairly rapidly during recent years, and there is now no excuse for anyone with scholarly pretensions to have an opinion on the subject without first familiarizing himself with the nature of this evidence.

Miss Schwesinger's book presents a very complete and thorough review of the investigations in this field, particularly on the relation of heredity and environment to intelligence. This review occupies Chapter IV, which is the longest chapter and the heart of the book. In the 186 pages of this chapter the author reviews all the important studies in the field. The bibliography of this chapter contains 229 items.

The studies on intelligence are summarized under several methodological categories. The first compares individuals with similar heredity, twins, siblings, etc., to determine what relationship exists and how this relationship may be modified by variations in the environment. Under this head, for example, fall the studies of twins reared apart and siblings reared apart. In the second class fall the studies in which persons with similar environment but diverse heredity are compared. In a third large class fall a somewhat varied group of studies in which the effect of specific environmental factors is studied by tracing the effect of a change in the environment, by using the control-group technique, or by comparing test scores with standards. In this way the effect of culture factors and of physical factors is studied.

The survey of these studies reveals the fact that most of them use the method of statistical analysis. In some cases such analysis is fairly direct and satisfactory, as in the comparison of identical twins separated in infancy and reared apart. Even here, however, the data necessary for

exact measurement are far from complete. The factor of heredity is fairly well controlled, but our knowledge of the environment is sketchy and uncertain. The ideal method is experimental control, exercised over a long period of time and beginning in early life. Such an experimental, genetic study would yield something like definitive findings. The author points out the limitations of the previous studies and suggests lines of future experimentation.

The other parts of the book review work which does not bear so directly on the determination of the relation of heredity and environment. The first two chapters are introductory. They present a rather full and detailed description of the kinds of tests which are used in the investigation of the problem, one referring to tests of intelligence and the other to tests of personality. The purpose of these reviews is to acquaint the student of heredity and environment with the nature of the instruments which have made possible the more precise study of their effect. It is not too much to say that the refinement of the tests is one of the essentials of the modern studies, the other essentials being appropriate experimental set-up and statistical analysis. A knowledge of the tests is a part of the necessary equipment of the investigator and is useful to one who seeks to interpret the studies.

The remainder of the book deals with theories rather than with evidence. The author believes that the evidence concerning the influence of heredity and environment on personality, exclusive of intelligence, is so meager that little can be done in this field but to review the various viewpoints. This review is frankly descriptive, and not critical, though the author reveals the fact that she believes that the truth lies somewhere between two extreme views that personality is moulded entirely by the environment or that it is made up by inborn traits. One may find in Chapter V a very fair account of the views which derive personality from bodily constitution, for example the glands of internal secretion, the views which stress the influence of social influences, as held by the behaviorist and the social psychologist, and the theories of various schools of psychiatry. The great diversity of the theories of the determination of personality indicates the abundance of the problems that remain to be solved.

The book is a reliable review of the field which it purports to cover. The author does not pretend to make much independent criticism of the studies she describes, but does report the criticisms which have been made by others, without attempting to adjudicate between various critics unless the issue seems obvious. This was doubtless the best procedure to follow. The review has been prepared in a workmanlike and thorough manner and is a very useful contribution to the field.

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